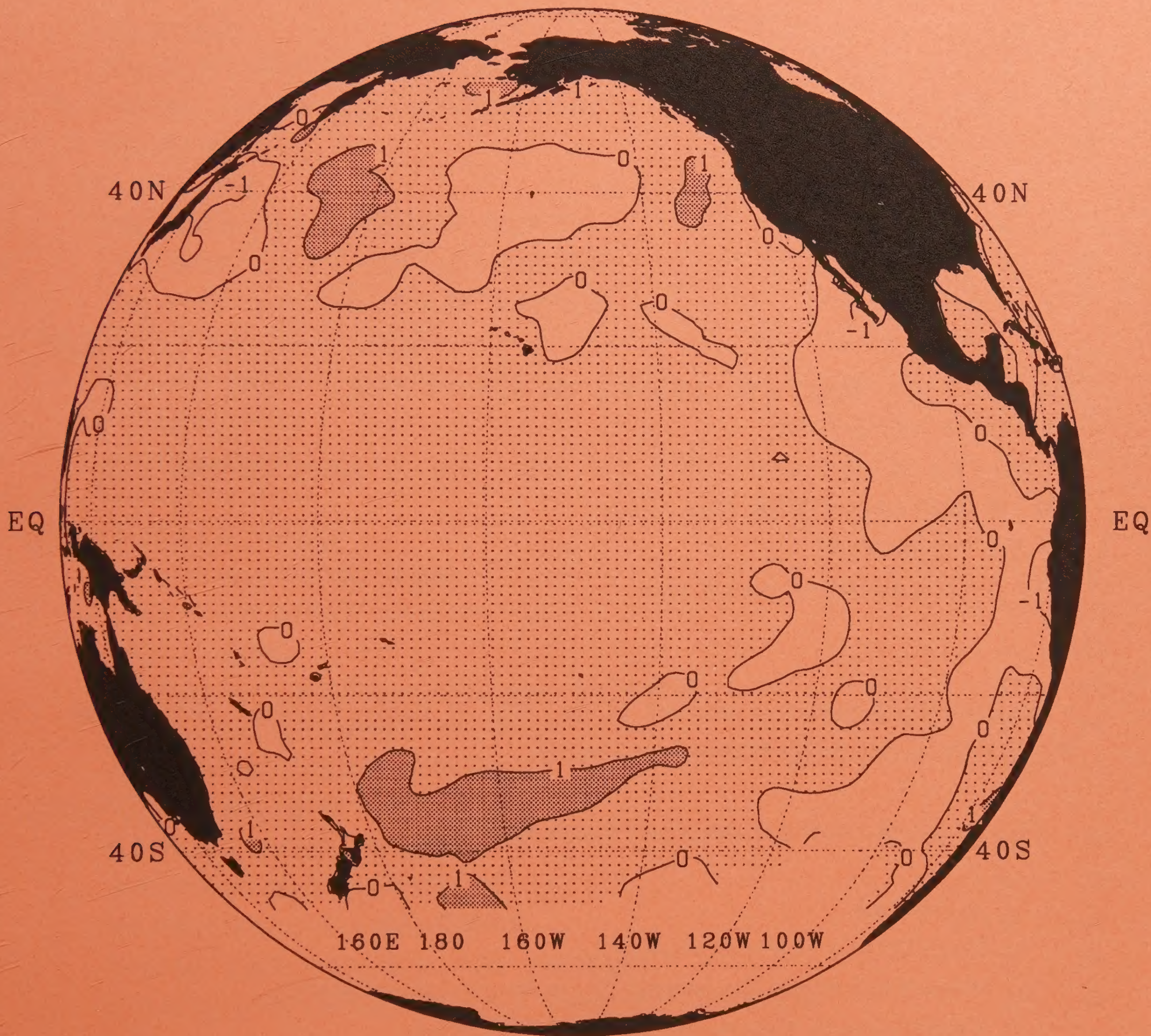
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Monthly Ocean Report

July 2003 (No. 127)



Climate and Marine Department

Japan Meteorological Agency

気象庁 気候・海洋気象部

平成15年7月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋気象情報室で作成しています。
本月報に関する問い合わせは、

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Monthly Ocean Report is prepared by the Office of Marine Prediction, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2003 年 7 月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for July 2003 in the Pacific Ocean.
Areas of positive anomalies are shaded.

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海況の特徴（２００３年７月）

日本近海の海況

海面水温は、日本海北部と南西諸島周辺の海域を除き、全般に平年より低かった。本州の日本海沿岸、本州東方、および32°N、148°E付近では平年より1℃以上低く、深さ100mで5℃以下の親潮系冷水の沿岸よりの分枝は、平年より大きく南下し、宮城県沖まで達していた（図４、図６）。

黒潮は、月を通じて四国から紀伊半島にかけて接岸して流れていた。その後、東海沖を東に流れた後、北東に向きを変え、三宅島の南を通過して、房総半島沖を北東に流れていた（図９）。

太平洋の海況

太平洋赤道域の海面水温は、150°Eから175°Eにかけてと135°E 付近、160°W付近、145°W付近、125°W付近で平年より0. 5℃以上高かった。一方、ペルー沿岸では平年より1℃以上低かった。

北太平洋の海面水温は、30°Nから45°Nの165°Eから175°Wにかけてと北米沖の40°N、130°W付近で平年より1℃以上高かった。一方、35°Nから45°Nの160°Wから145°W付近にかけてと20°N、115°W付近では、-0. 5℃を超える負偏差が見られた（図１７）。

Highlights July 2003

Seas adjacent to Japan

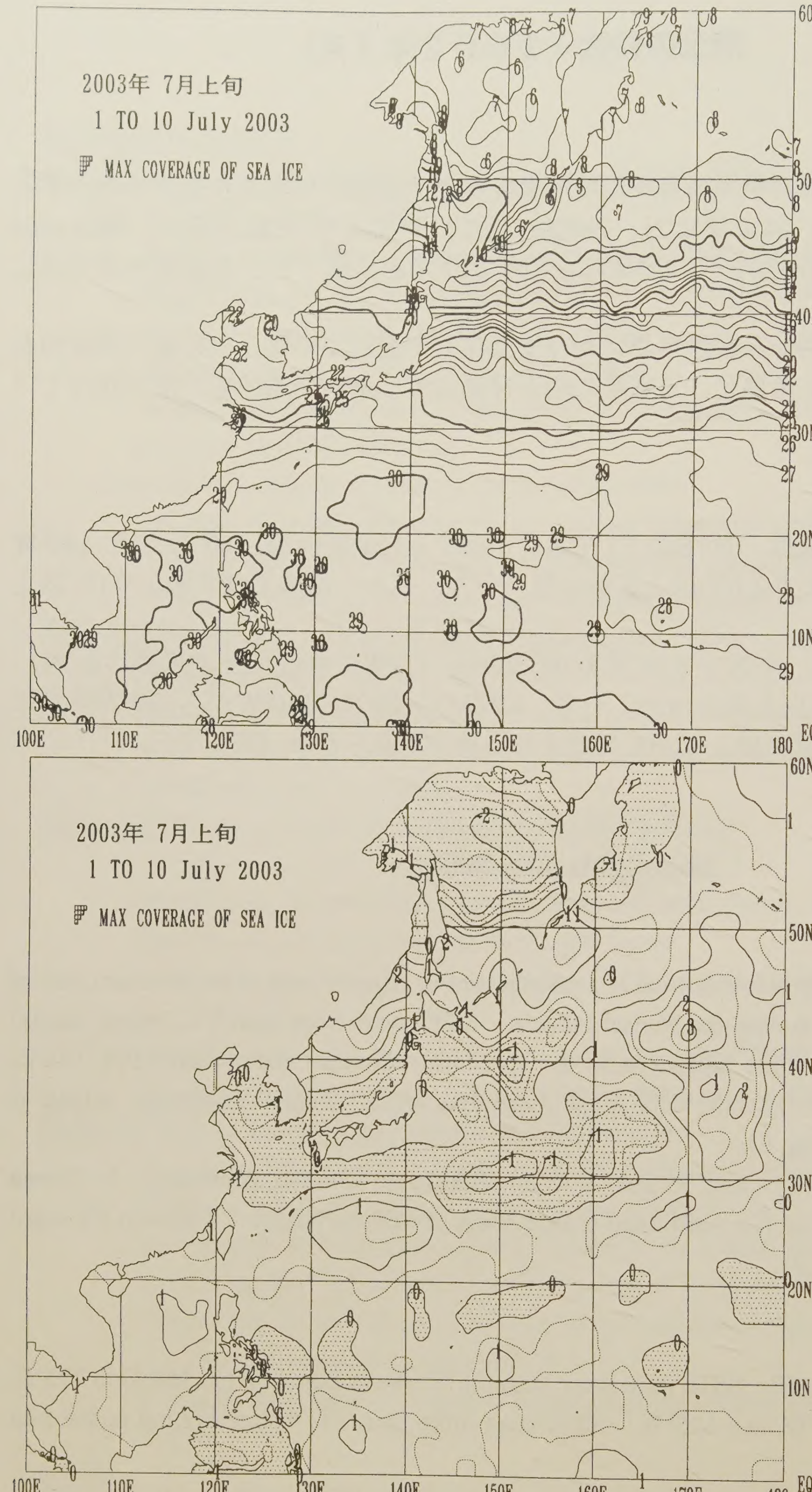
SSTs were generally below normal in seas adjacent to Japan except in the northern part of the Japan Sea and the seas around the Nansei Islands. SSTs were more than 1℃ below normal along the coasts of Honshu in the Japan Sea, in the seas east of Honshu and around 32°N, 148°E. The coastal branch of the Oyashio cold water extended to off Miyagi prefecture, which is significantly south (Fig. 4, Fig. 6).

The Kuroshio flowed close to coasts from Shikoku to the Kii Peninsula. It flowed eastward off Tokai, and turned NE-ward, then passed south of Miyake Island. It flowed NE-ward off the Boso Peninsula (Fig. 9).

Pacific Ocean

In the equatorial Pacific, SSTs were more than 0.5℃ above normal from 150°E to 175°E, around 135°E, 160°W, 145°W, and 125°W. SSTs were more than 1℃ below normal in the seas off Peru.

In the North Pacific, positive SST anomalies exceeding +1℃ were found from 165°E to 175°W between 30°N and 45°N and around 40°N, 130°W. SSTs were more than 0.5℃ below normal from 160°W to 145°W between 35°N and 45°N and around 20°N, 115°W (Fig. 17).

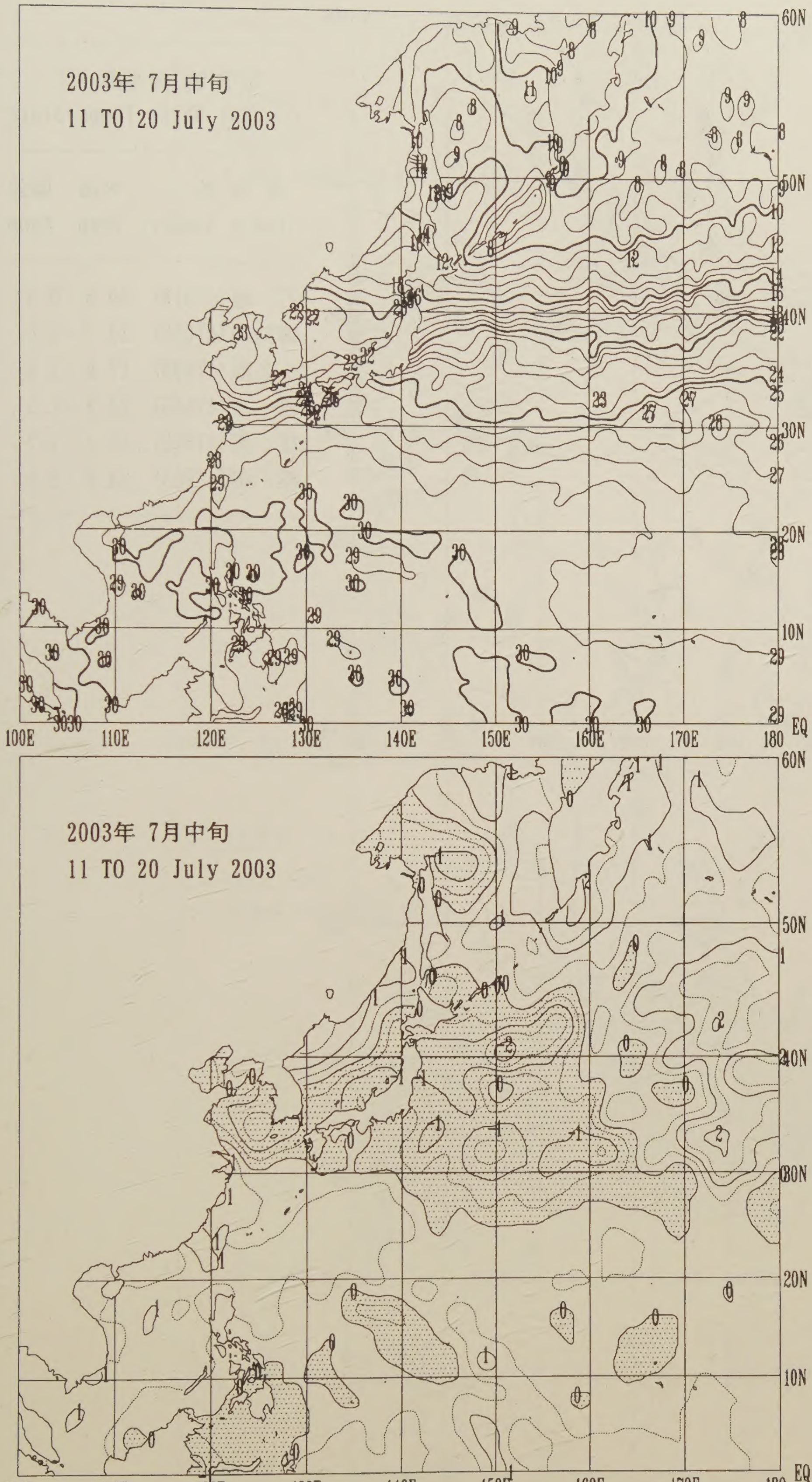


旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	28.7	-0.2
御前崎(47655)	21.8	-1.0
小名浜(47598)	17.5	0.2
宮　古(47585)	13.8	-0.9
江　差(47428)	17.7	-0.2
浜　田(47755)	22.9	0.2

第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2003年 7月上旬)

Fig. 1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in July 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

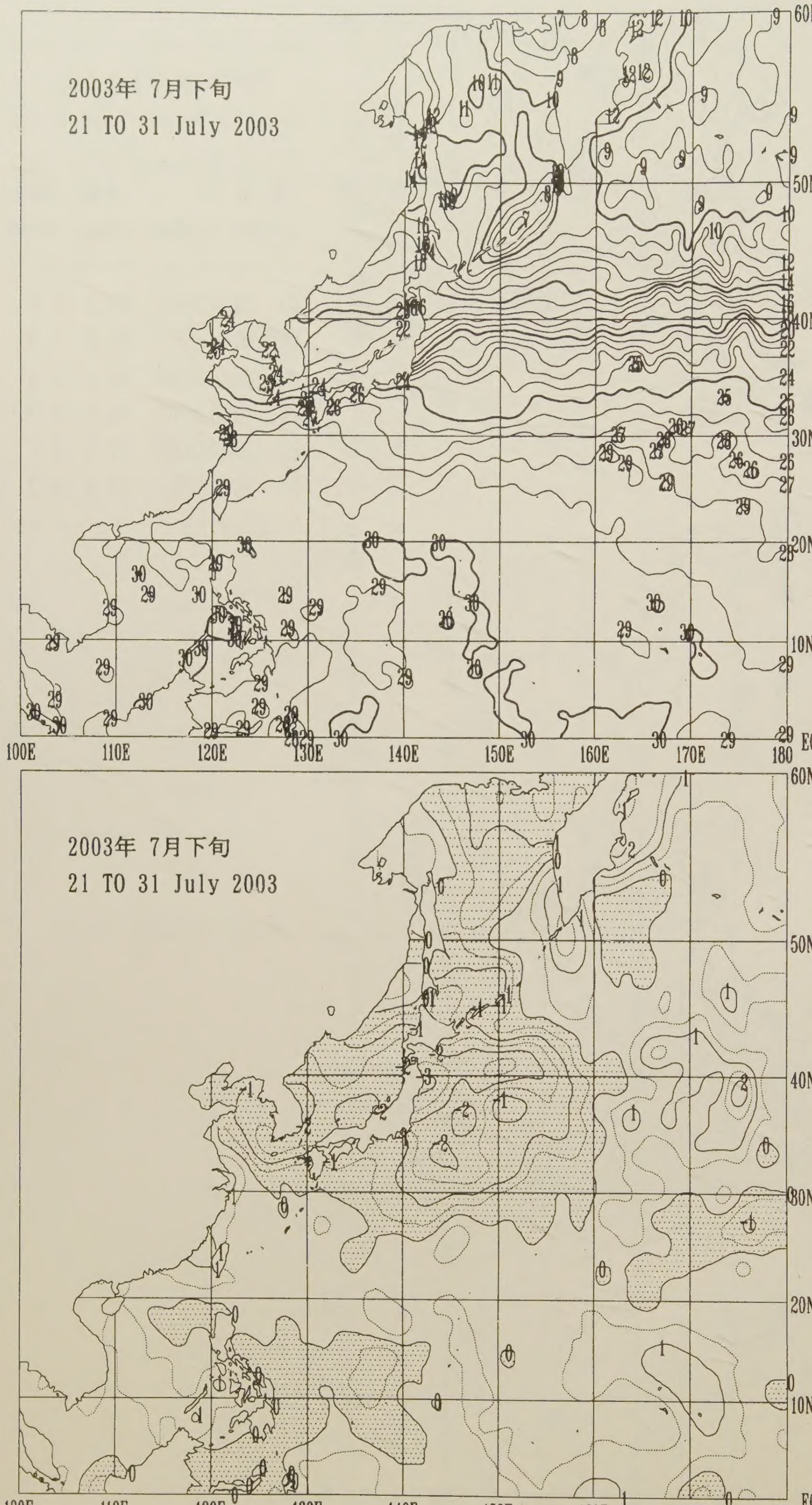


旬平均沿岸水温 (℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣 (47918)	29. 2	0. 0
御前崎 (47655)	22. 5	-1. 3
小名浜 (47598)	16. 8	-1. 4
宮　古 (47585)	14. 6	-1. 0
江　差 (47428)	17. 3	-1. 7
浜　田 (47755)	23. 4	-0. 9

第2図 北西太平洋旬平均海面水温図 (上) 及び偏差図 (下) (2003年 7月中旬)

Fig. 2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in July 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

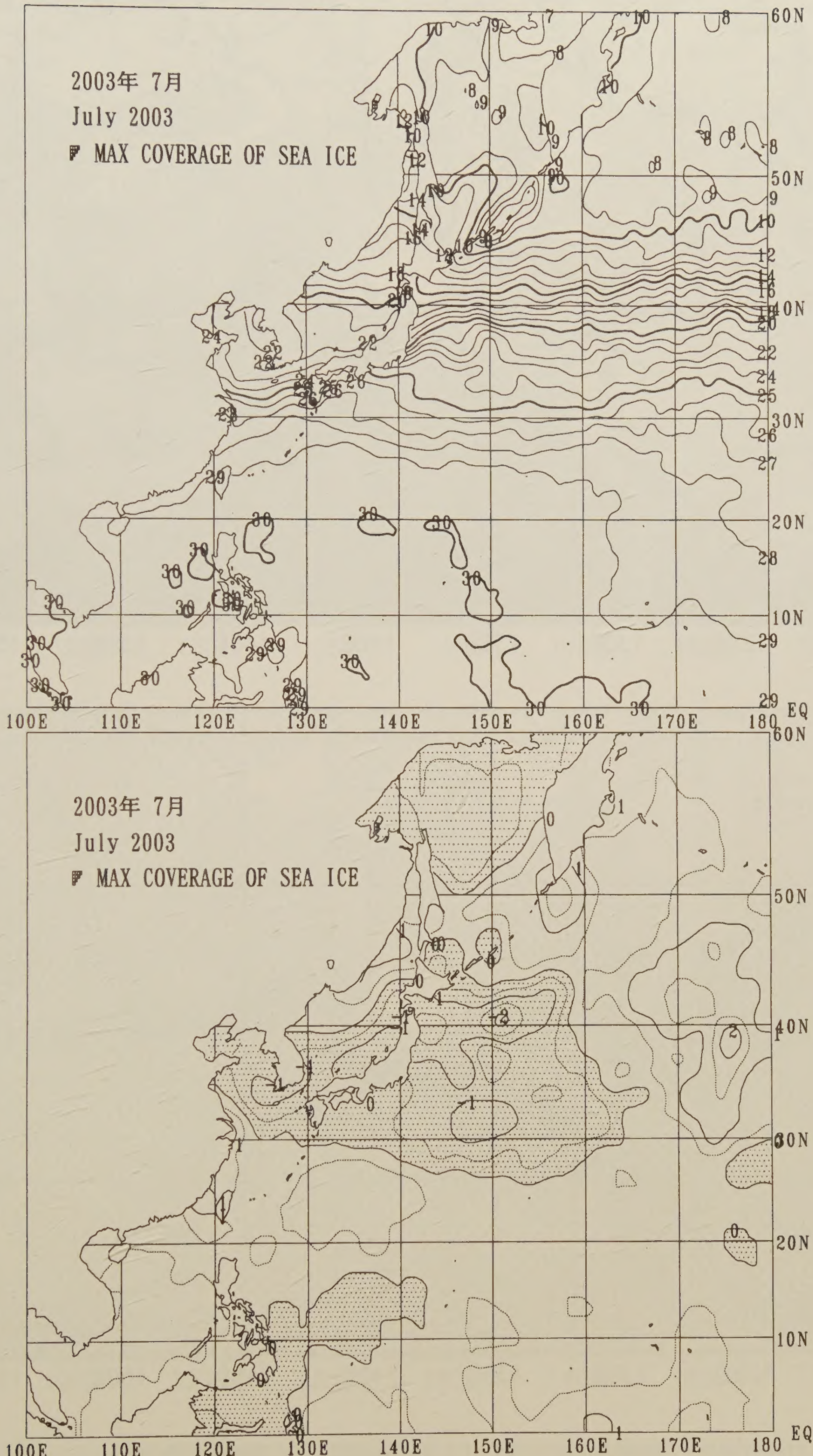


旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	29.6	0.4
御前崎(47655)	23.3	-1.6
小名浜(47598)	17.9	-1.8
宮　古(47585)	14.8	-2.3
江　差(47428)	19.2	-1.7
浜　田(47755)	24.5	-1.0

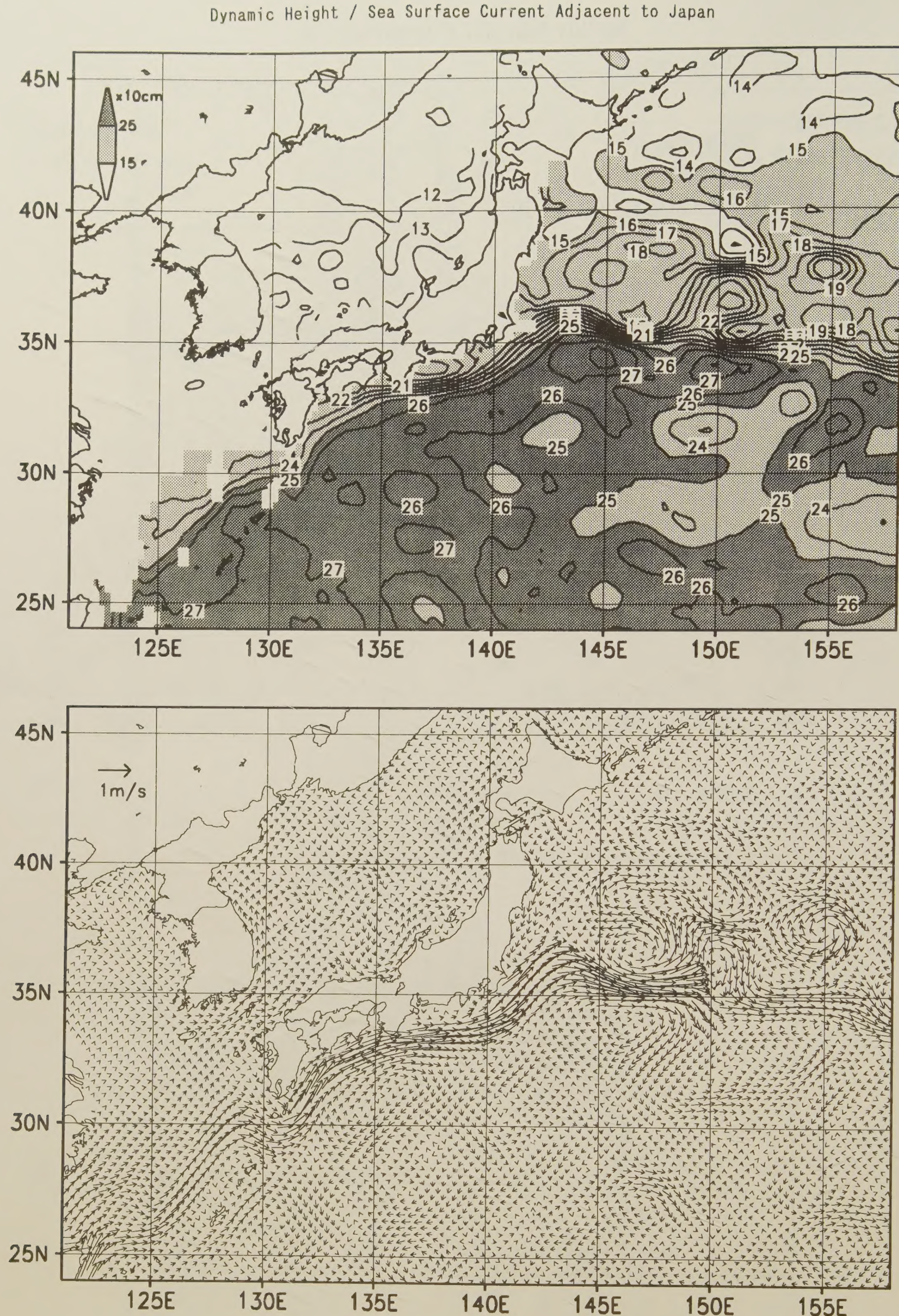
第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2003年 7月下旬)

Fig. 3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in July 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



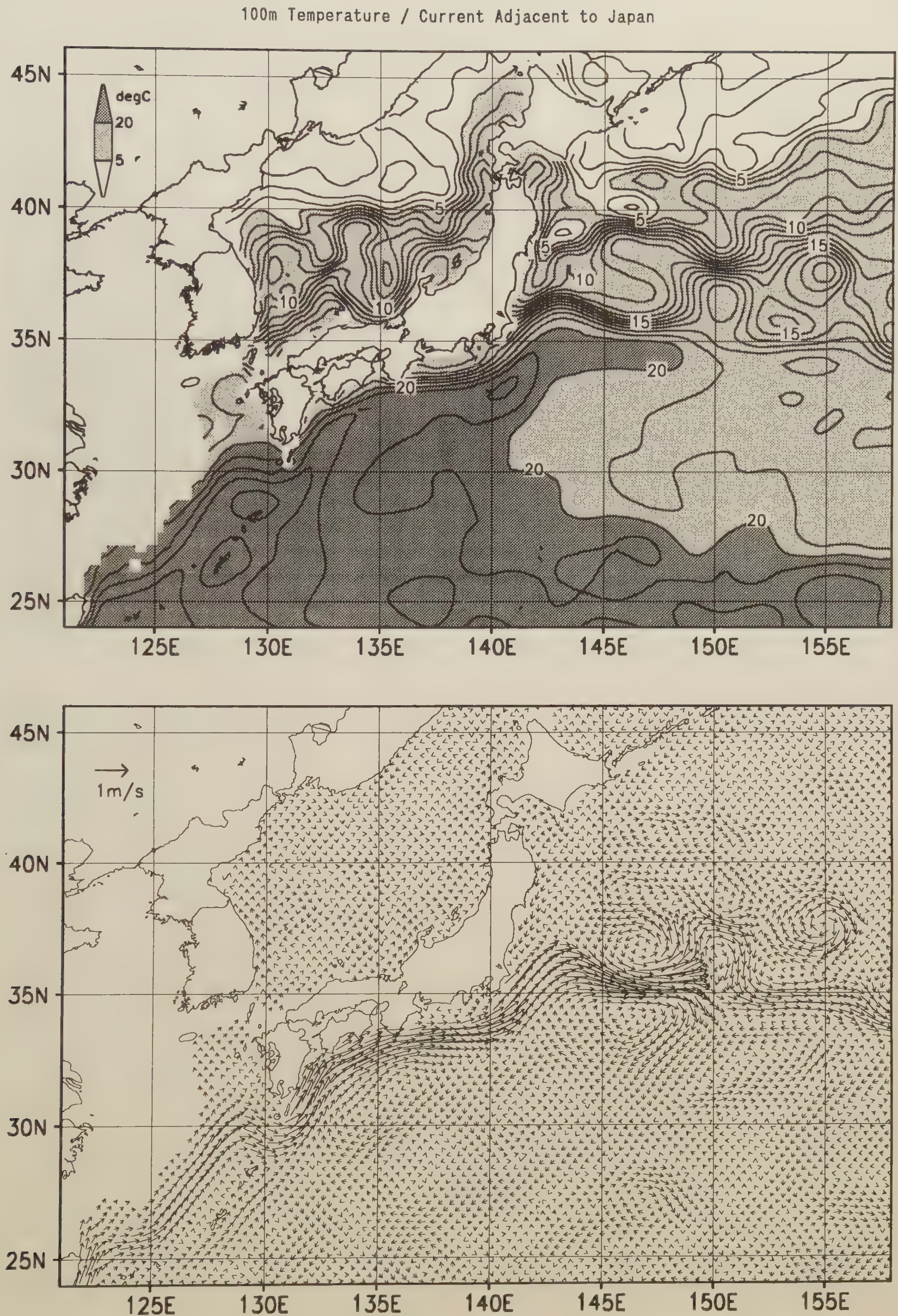
第4図 北西太平洋月平均海面水温図(上)及び偏差図(下)(2003年 7月)

Fig. 4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for July 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



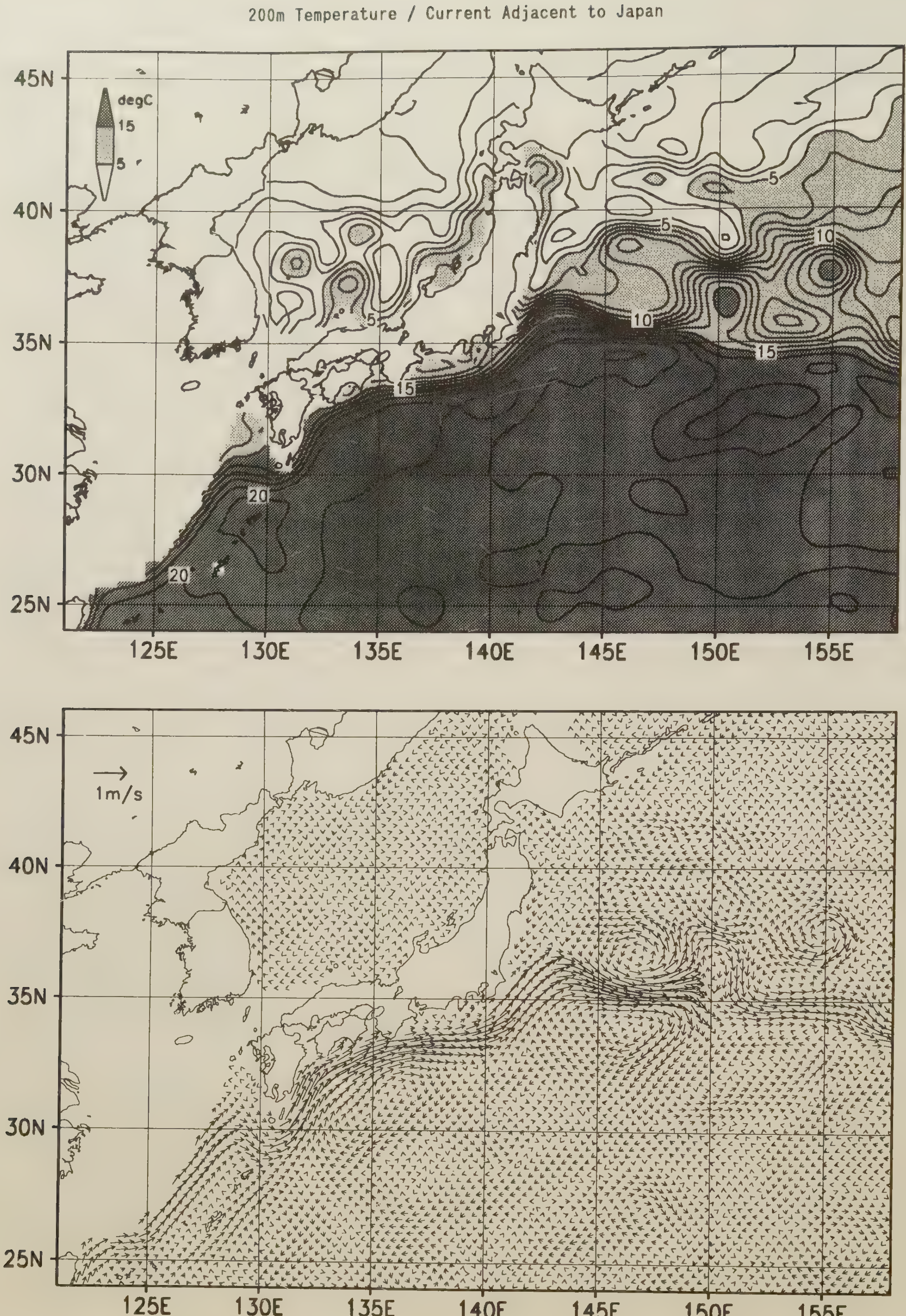
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(海洋総合解析システムによる)

Fig. 5　Monthly mean sea surface height (top) and current (bottom) in seas adjacent to Japan for July 2003. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



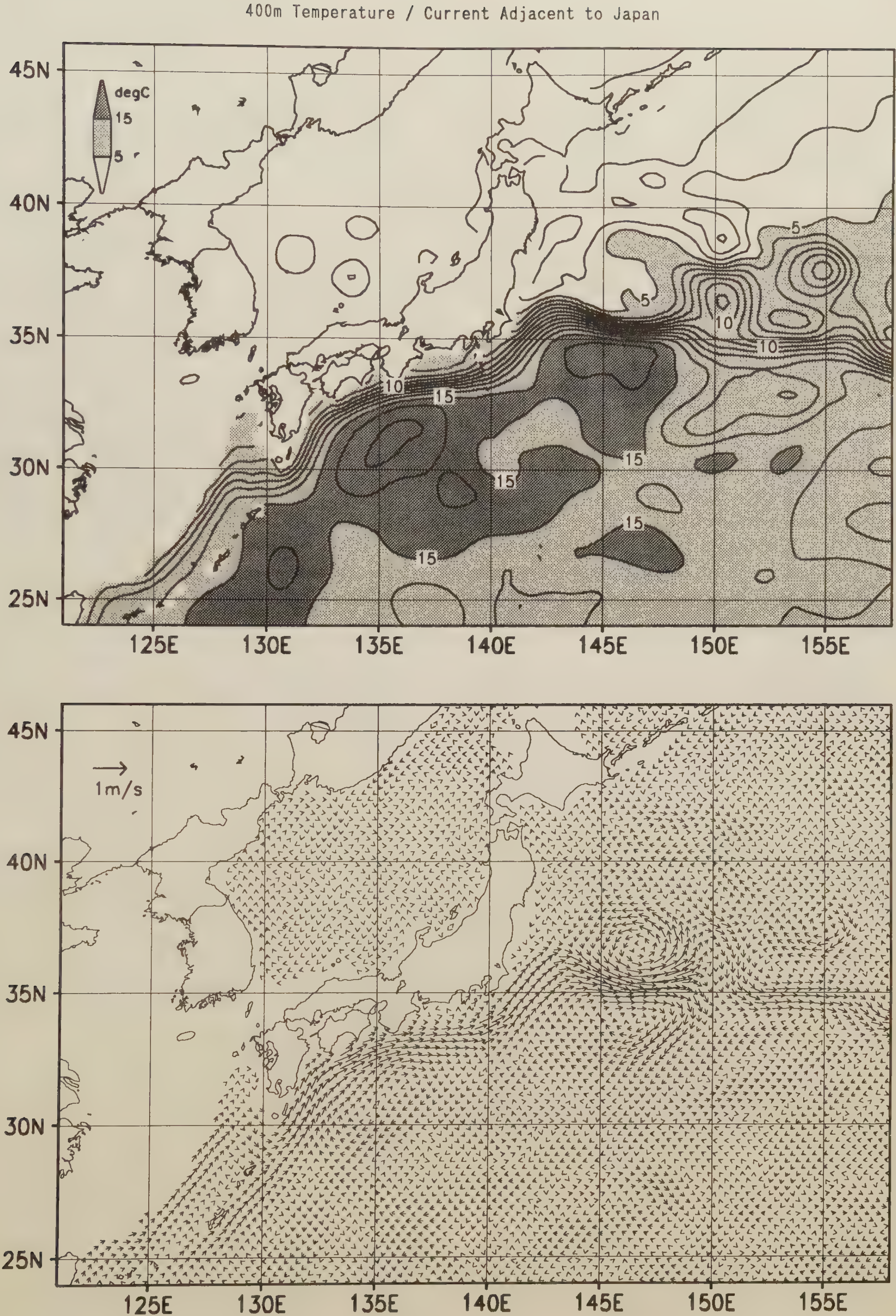
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（海洋総合解析システムによる）

Fig. 6　Monthly mean subsurface (100 m) temperature (top) and current (bottom) in seas adjacent to Japan for July 2003. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



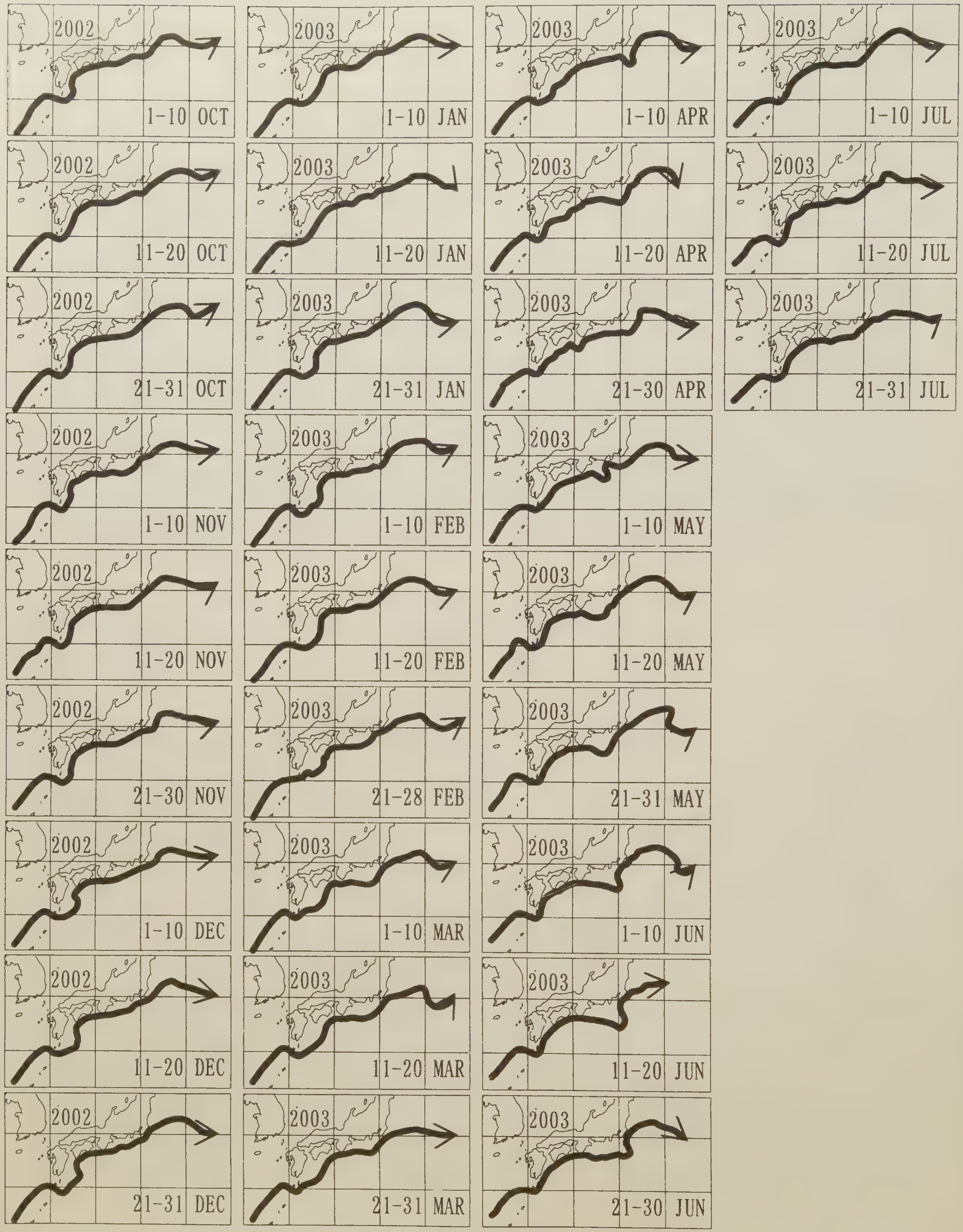
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（海洋総合解析システムによる）

Fig. 7　Monthly mean subsurface (200 m) temperature (top) and current (bottom) in seas adjacent to Japan for July 2003. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



第 8 図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 400 m）（2003 年 7 月）
（海洋総合解析システムによる）

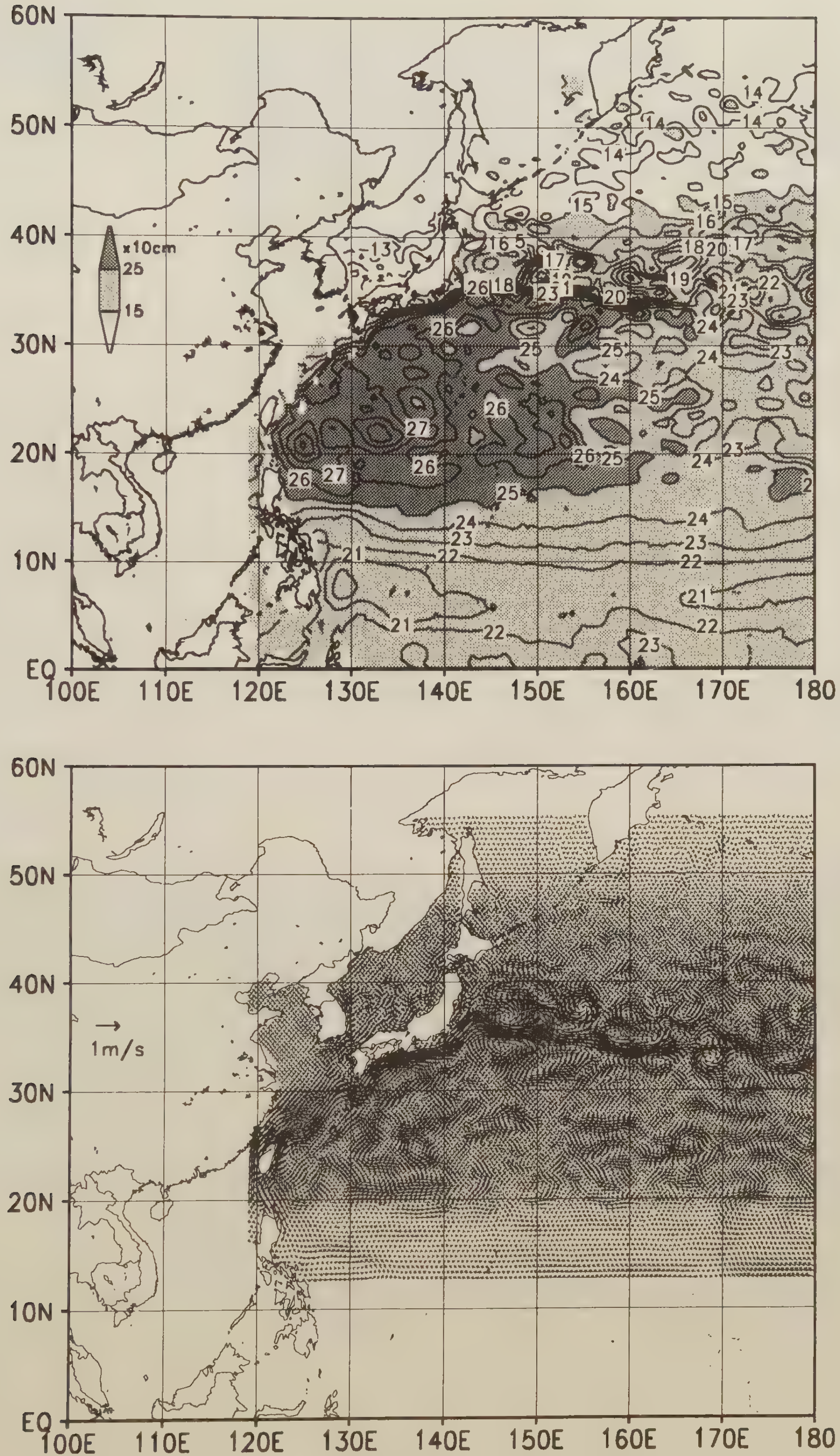
Fig. 8　Monthly mean subsurface (400 m) temperature (top) and current (bottom) in seas adjacent to Japan for July 2003. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



第9図 旬別黒潮流軸図

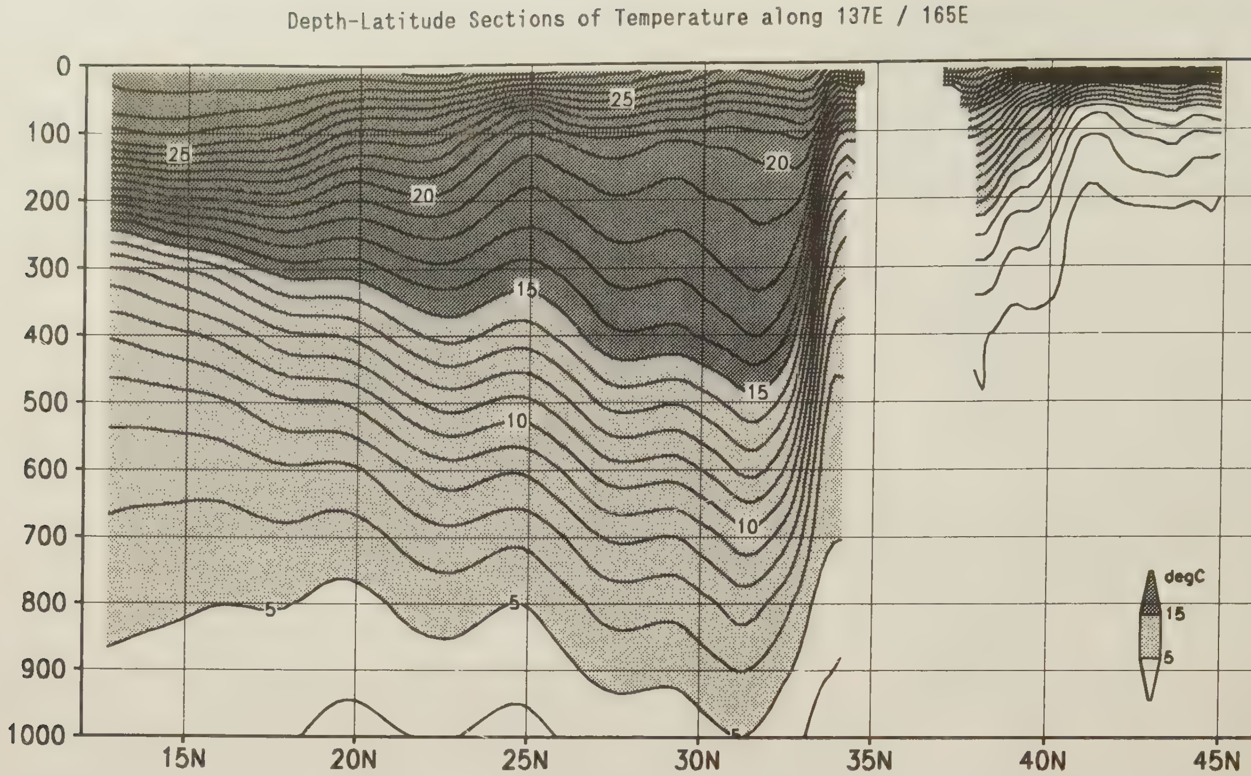
Fig. 9 Location of the Kuroshio axis

Dynamic Height / Sea Surface Current in the Western North Pacific



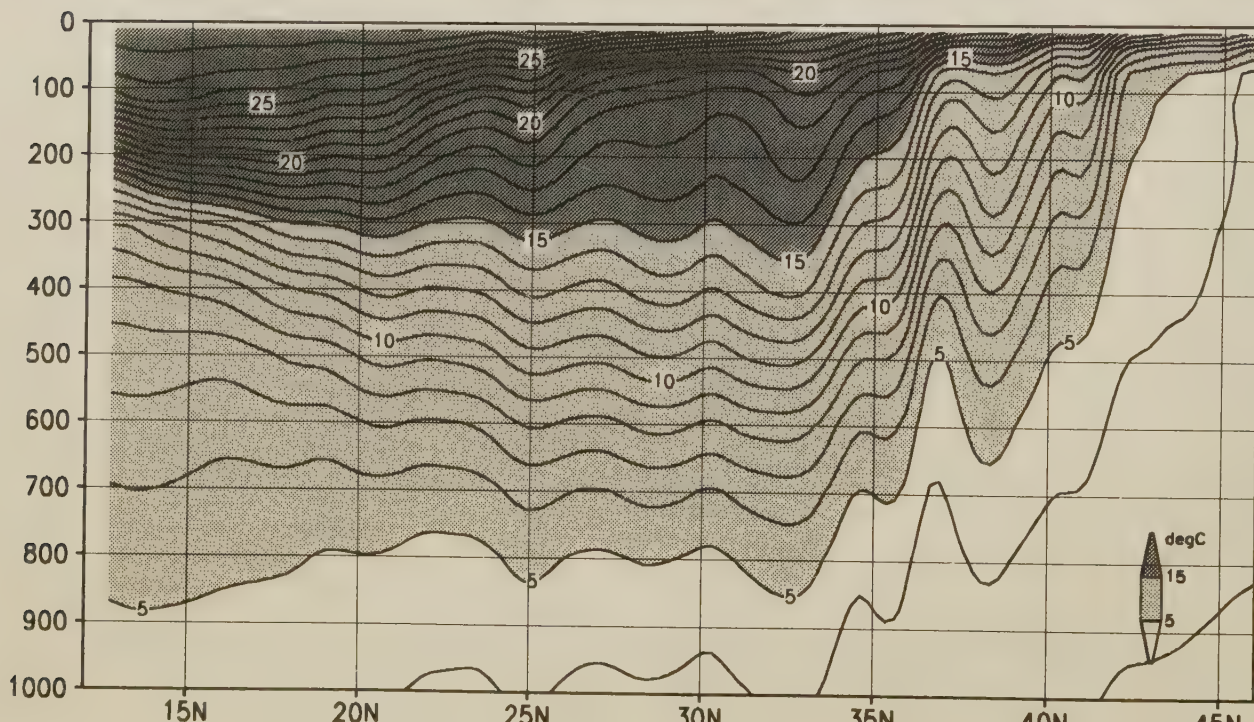
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(海洋総合解析システムによる)

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（海洋総合解析システムによる）

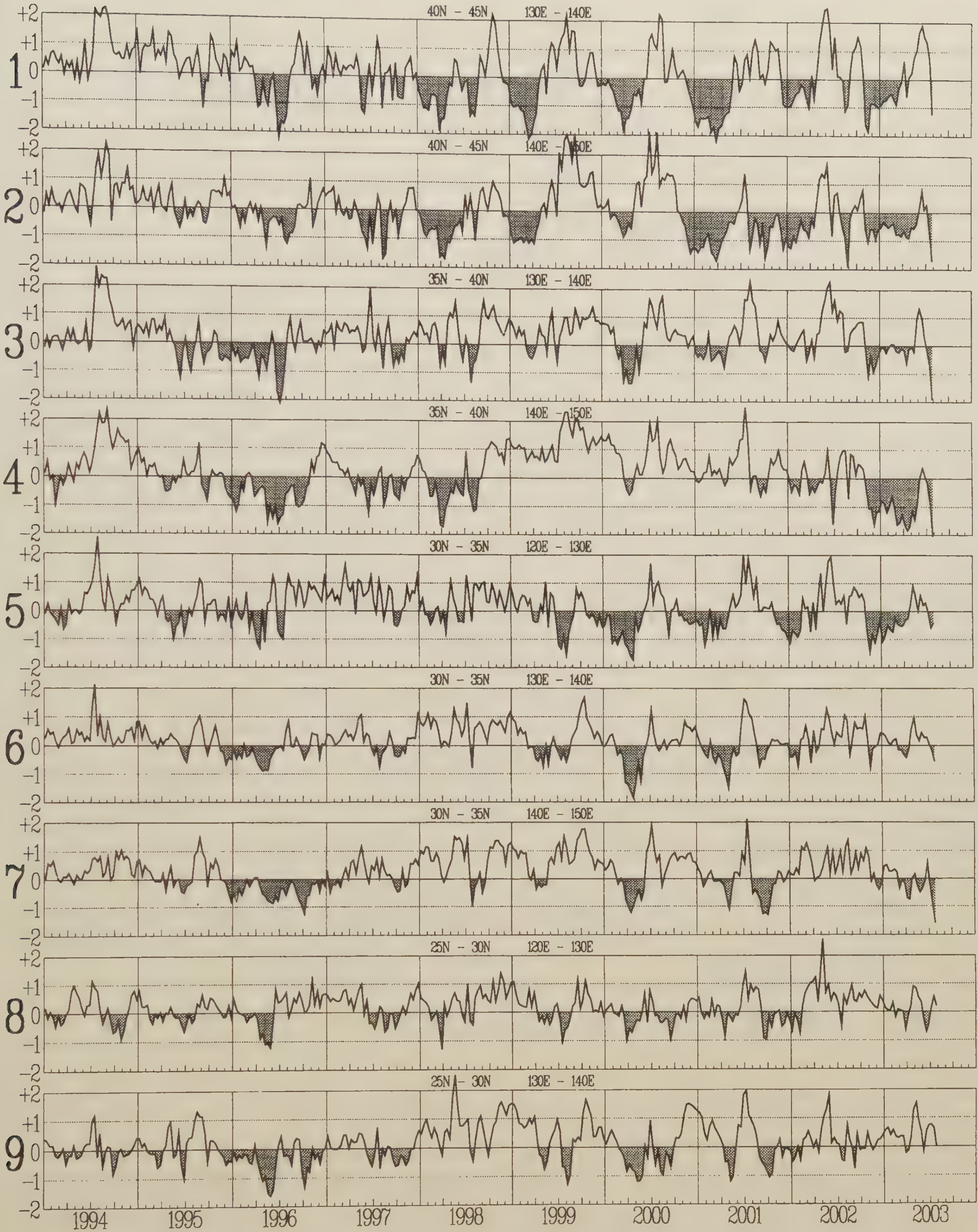
Fig. 11　Vertical cross section of monthly mean temperature along 137 °E for July 2003. Contour interval is 1 °C. (calculated by the Ocean Comprehensive Analysis System)

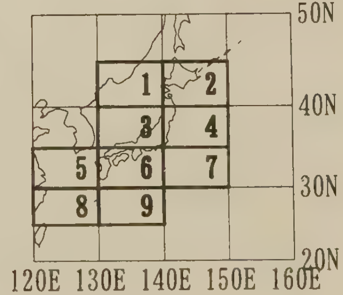


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Fig. 12　Vertical cross section of monthly mean temperature along 165 °E for July 2003. Contour interval is 1 °C. (calculated by the Ocean Comprehensive Analysis System)

Time Series of Area Mean SST in the Western North Pacific

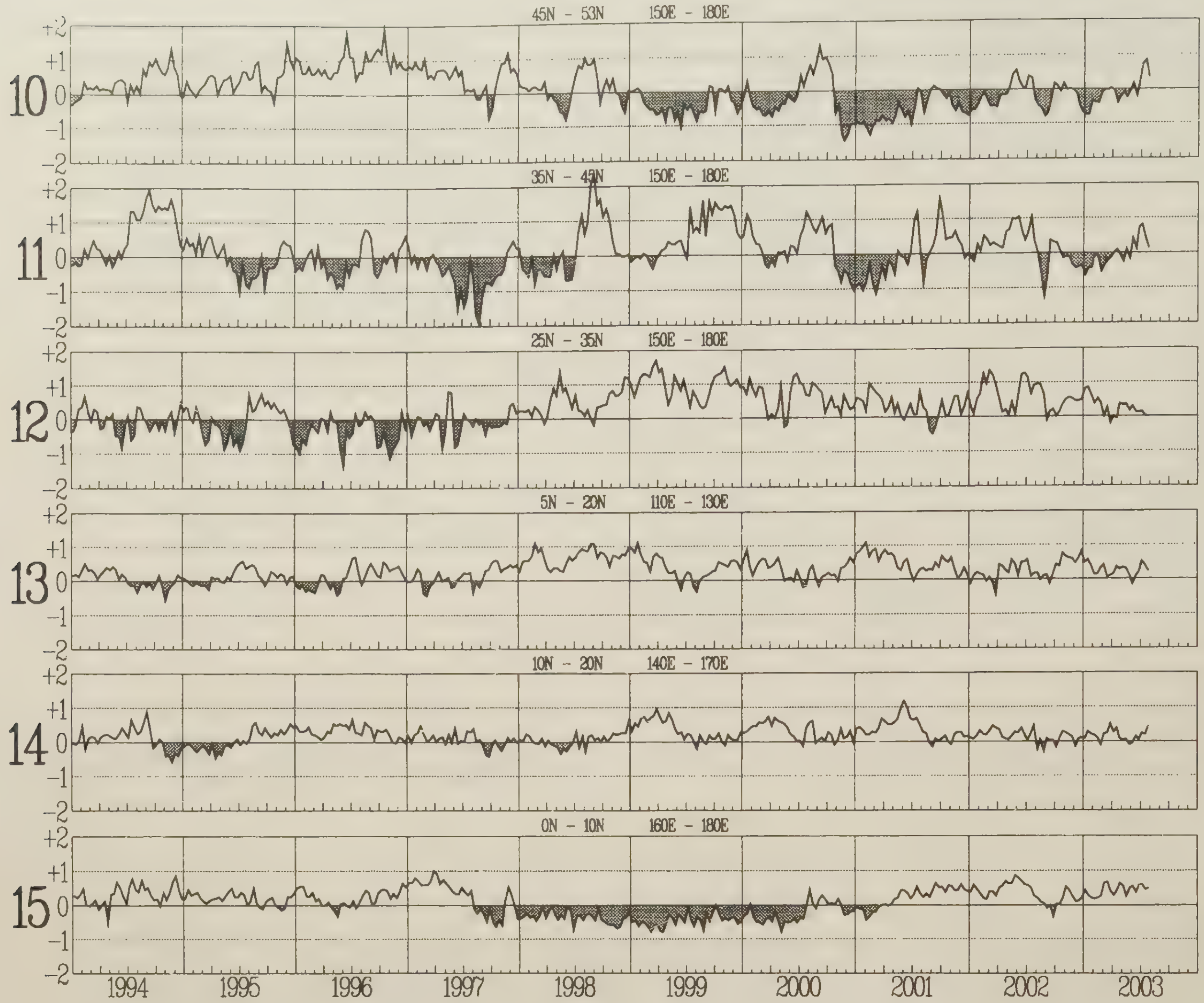




第13図　海域別旬平均海面水温平年偏差時系列図

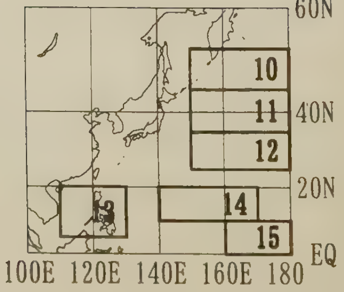
Fig. 13 Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

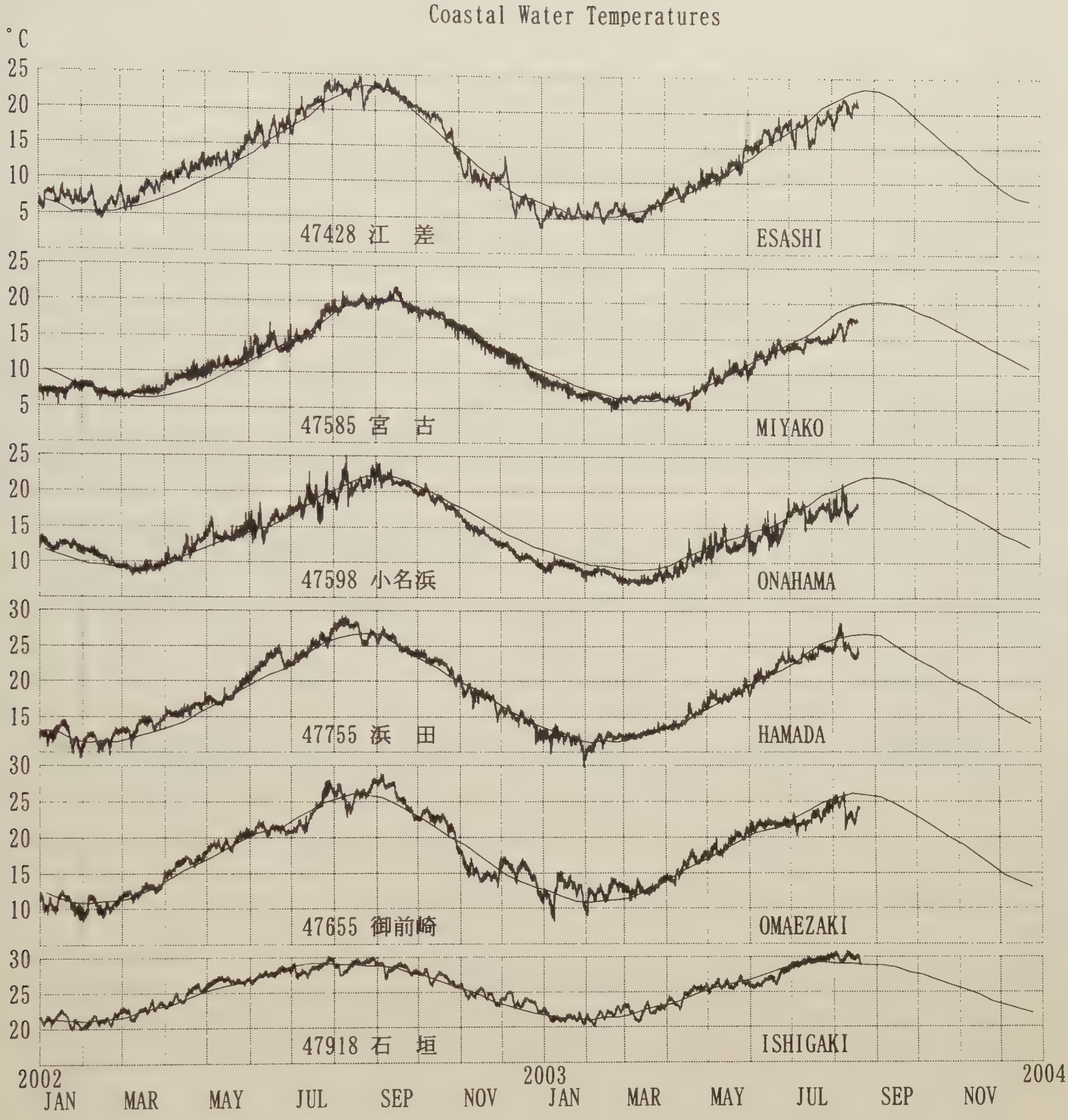
Time Series of Area Mean SST in the Western North Pacific

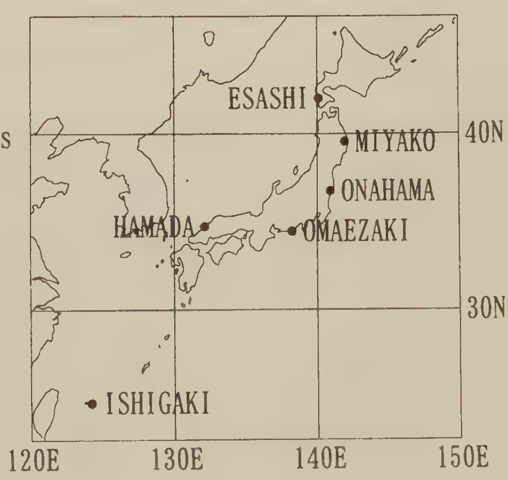


第13図　海域別旬平均海面水温平年偏差時系列図（つづき）

Fig. 13 (continue) Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).



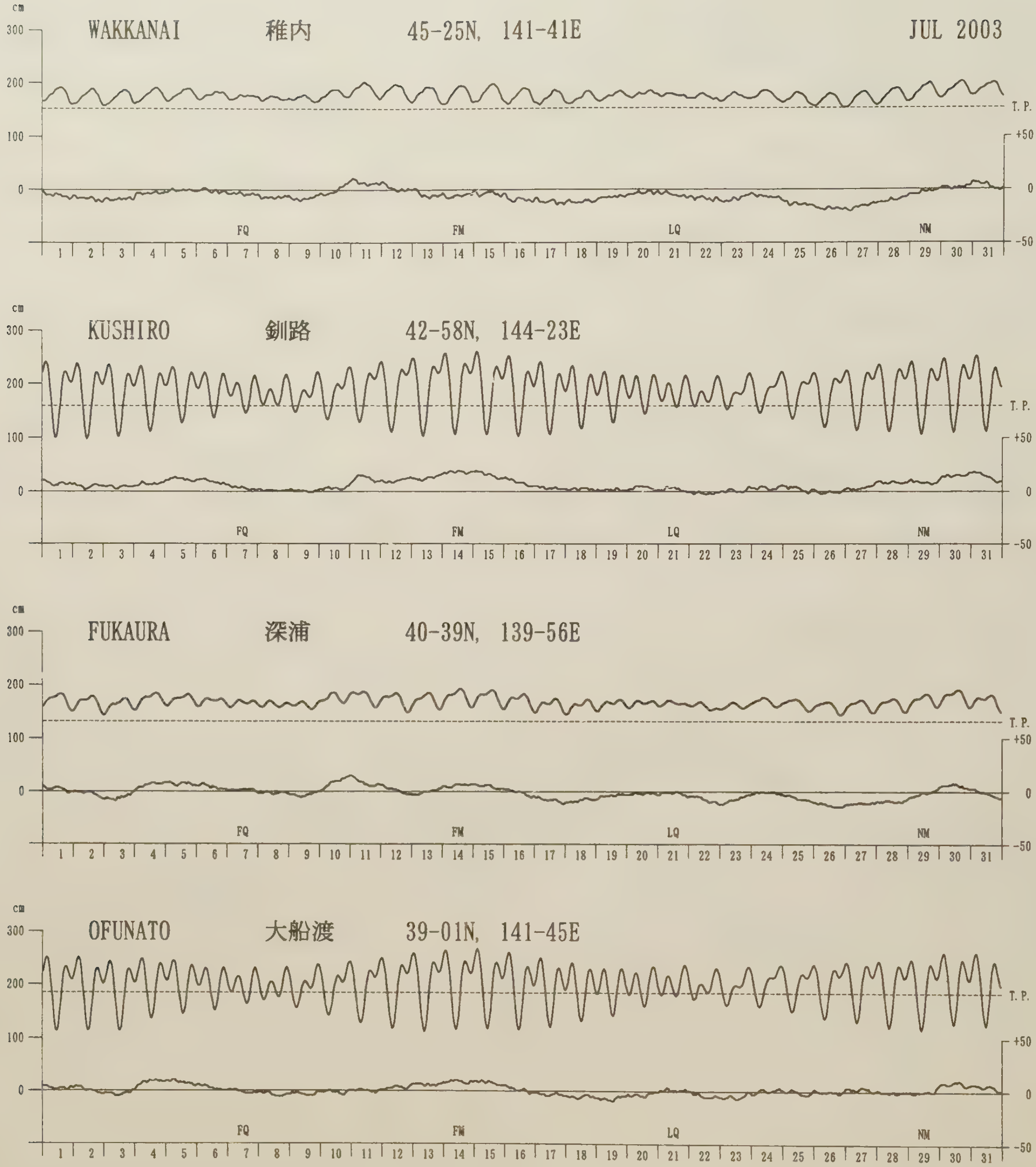




第14図 沿岸水温時系列図

Fig. 14 Time series of hourly coastal water temperatures (°C) measured at 6 coastal stations of the JMA shown in the right panel.
Thin lines show ten-day mean climatology.

Time Series of Sea Level



第15図 沿岸潮位時系列図（2003年 7月）

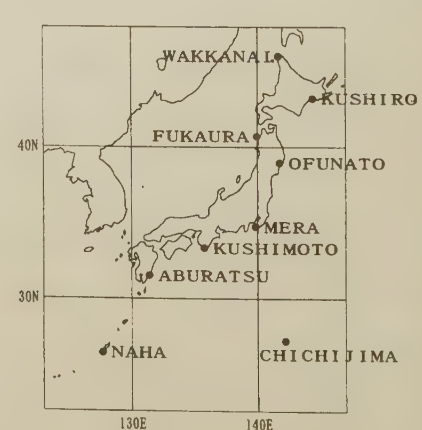
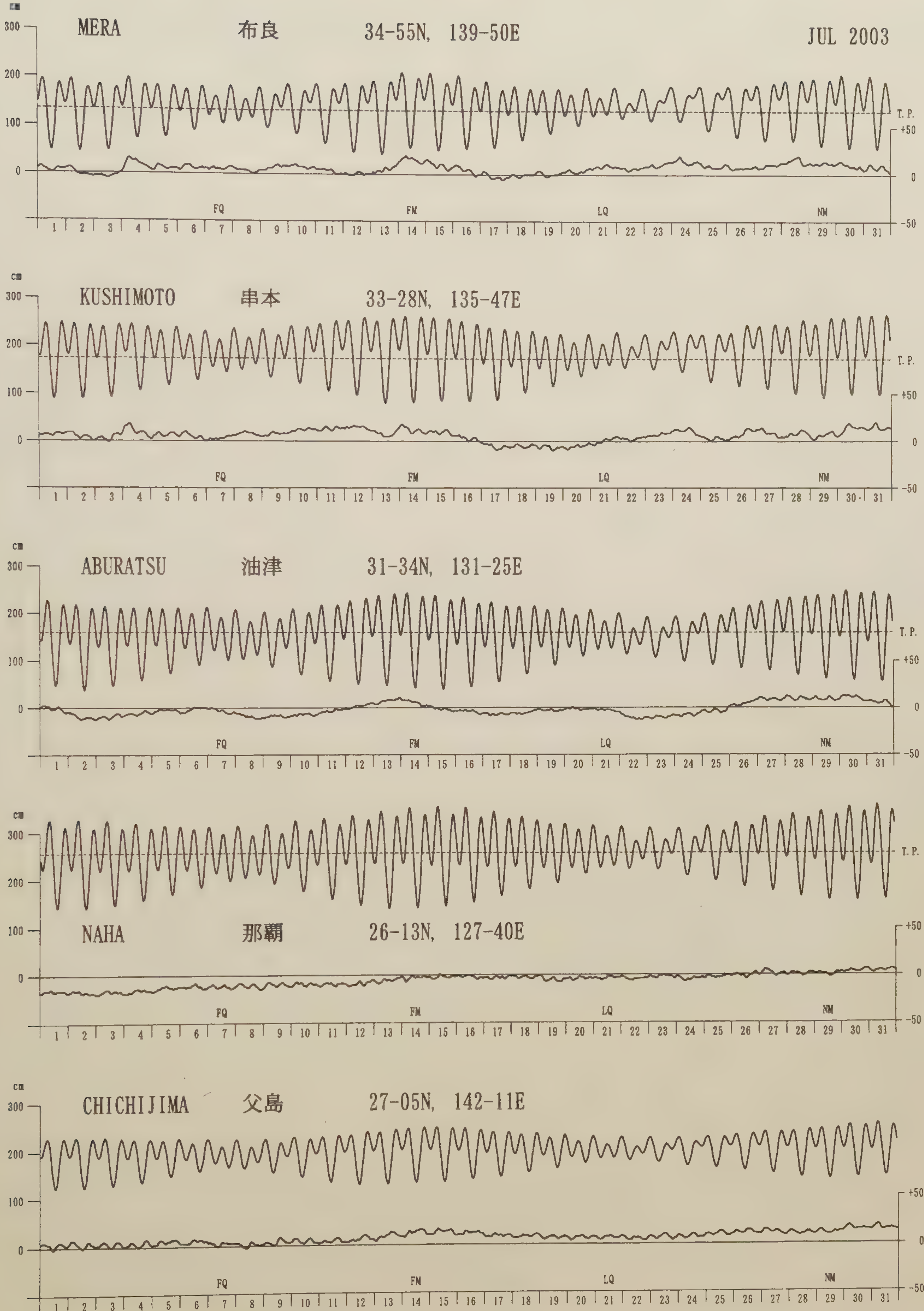


Fig. 15 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

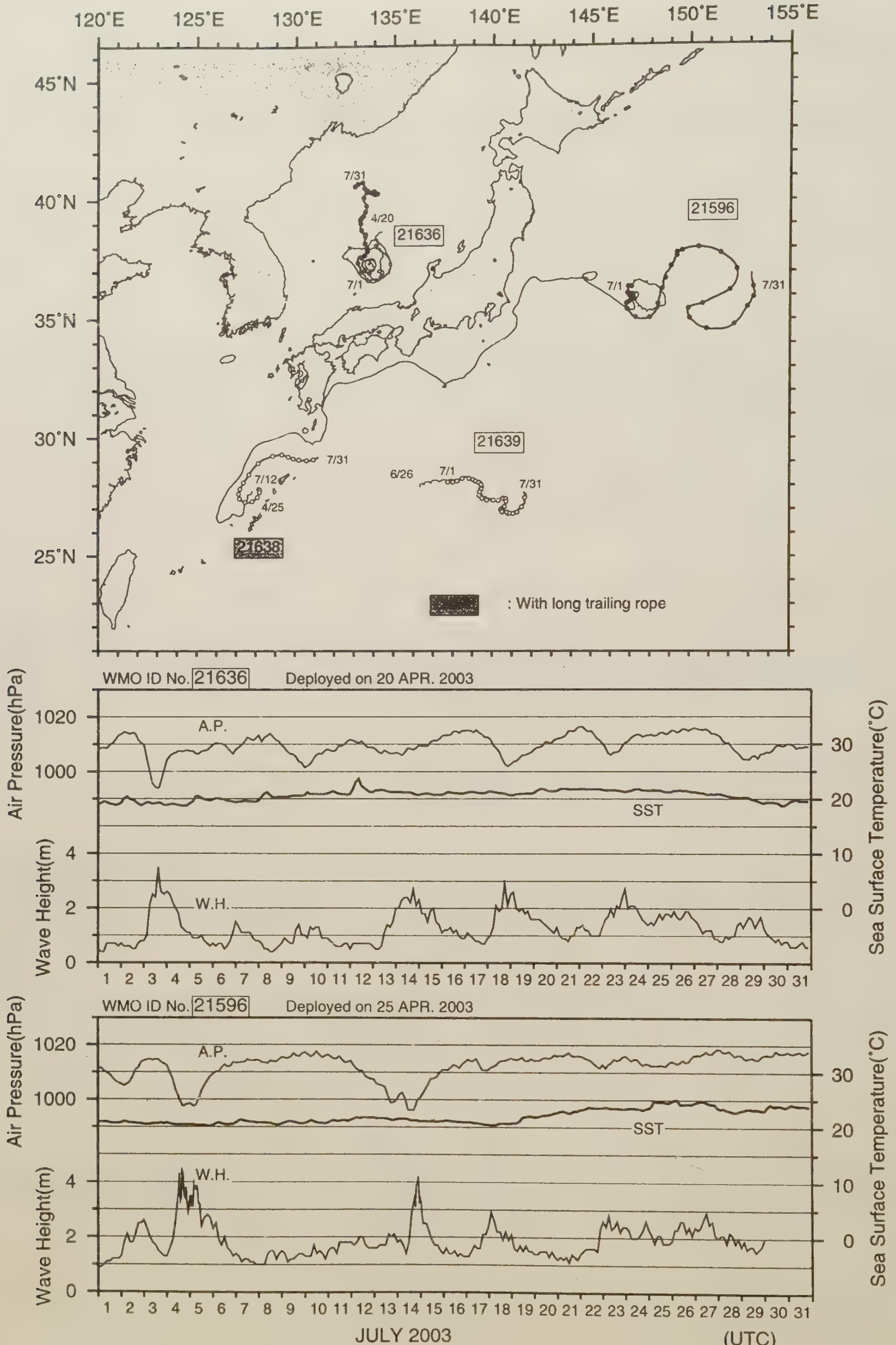
NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T. P. : Mean sea level of Tokyo Bay (Tokyo Peil)

Time series of Sea Level



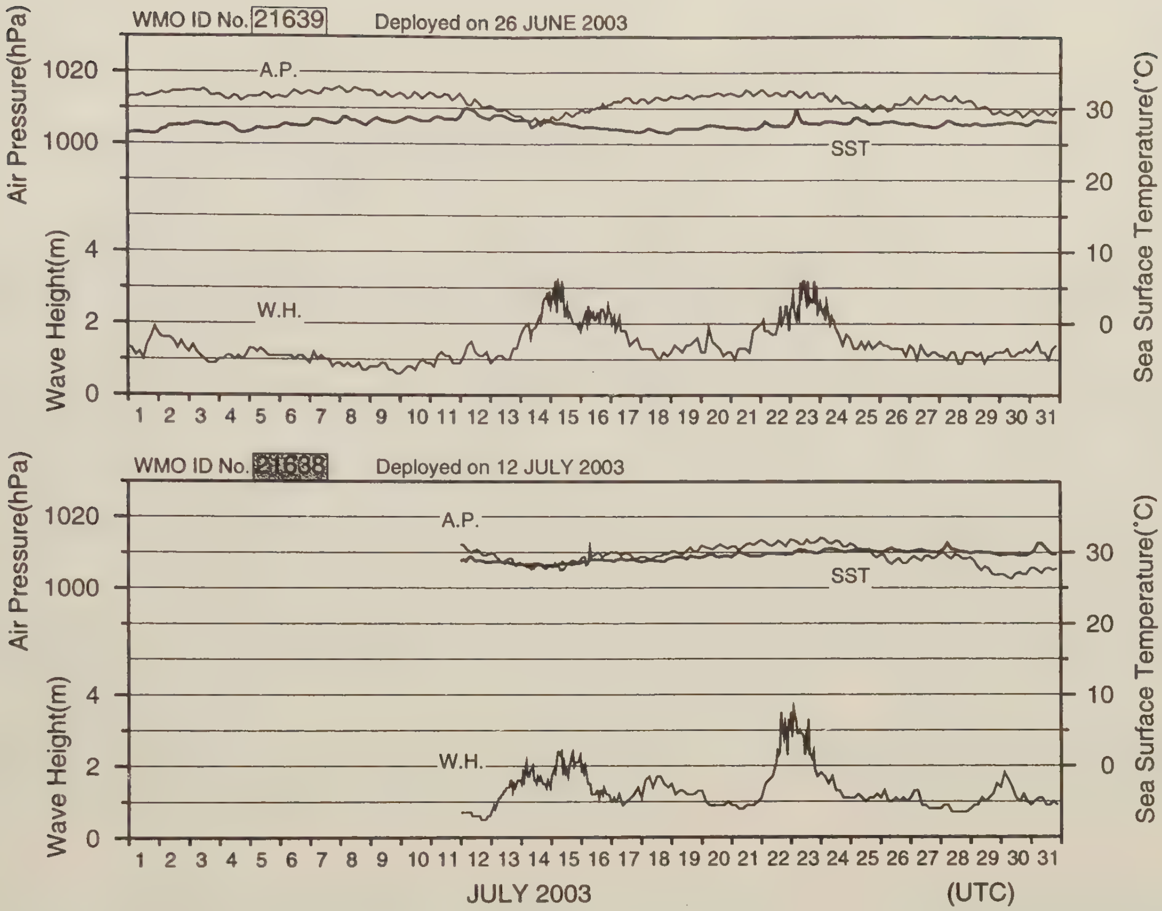
第15図 つづき

Fig. 15 continue



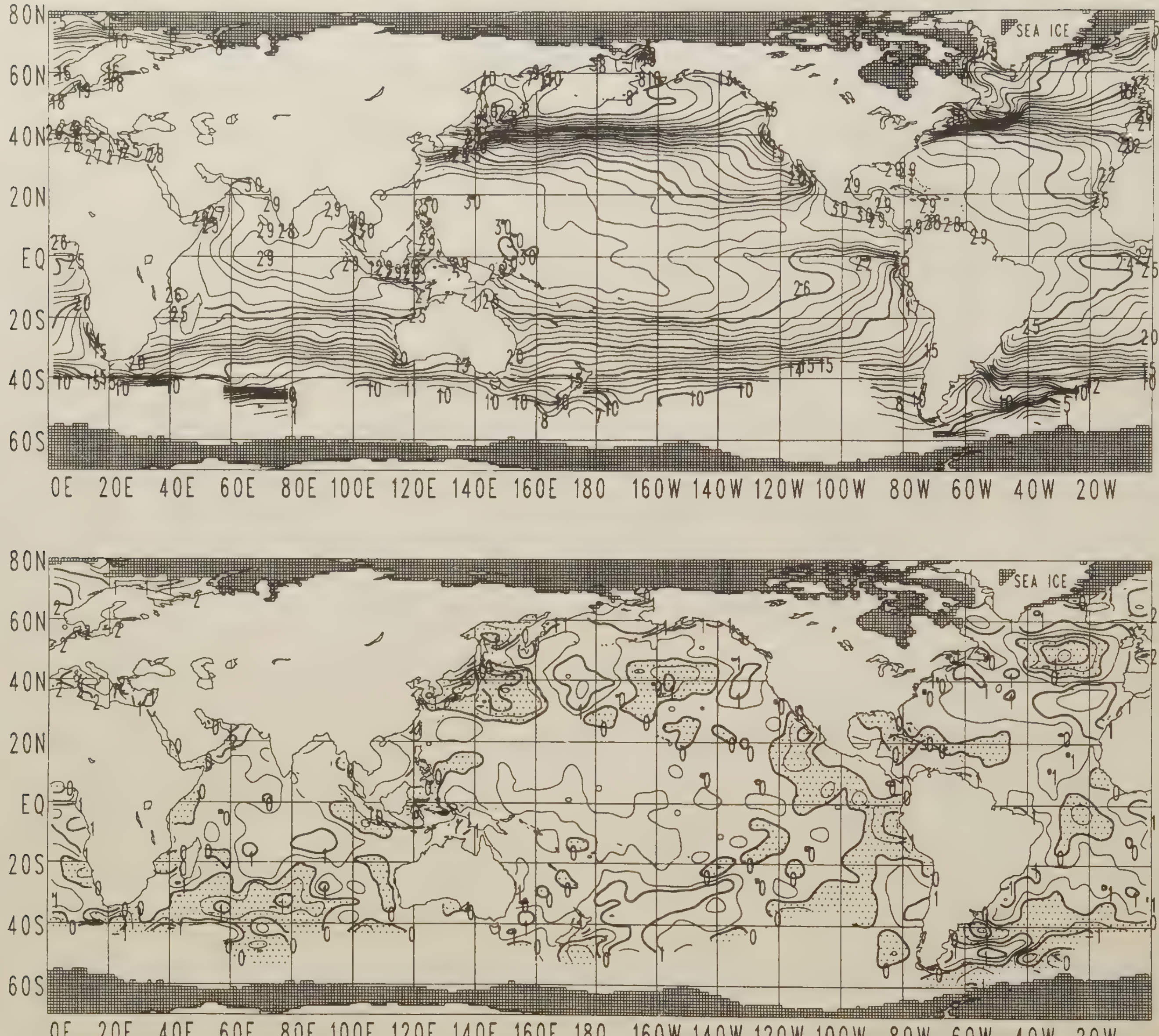
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Fig.16　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.



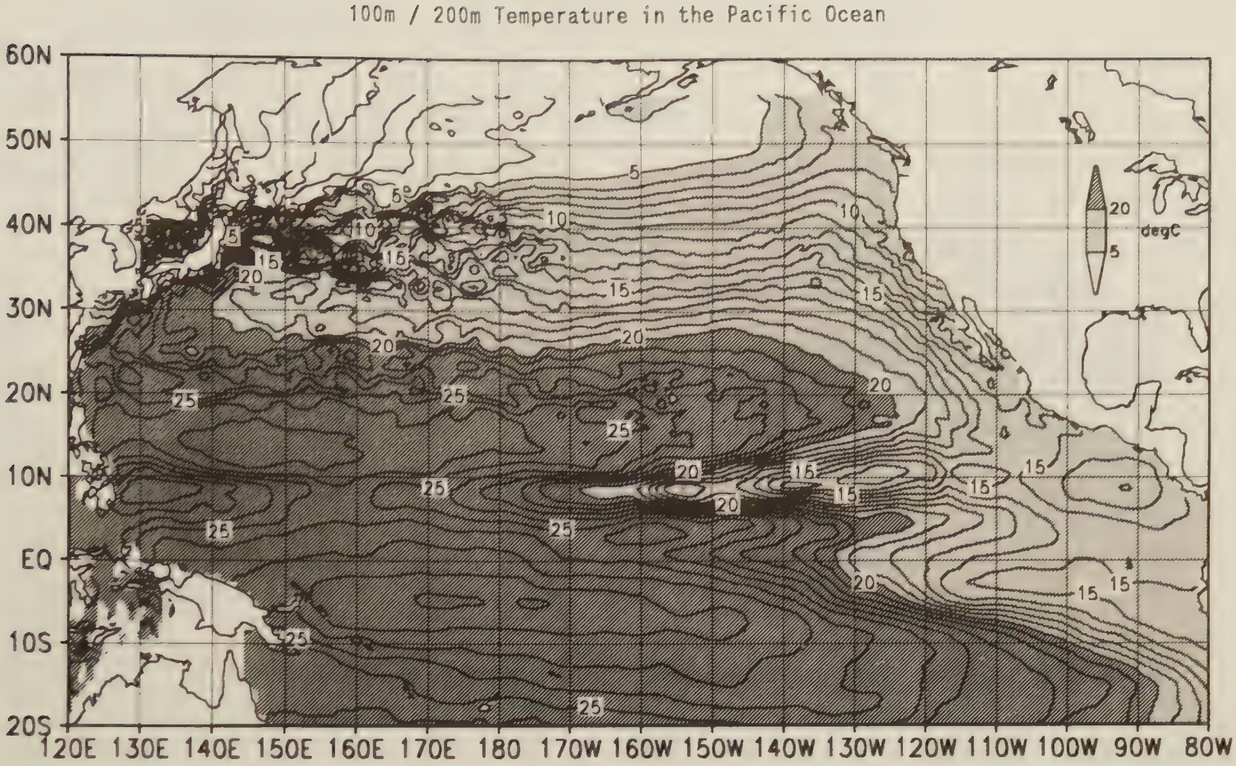
第16図 つづき
Fig.16 continue

SST & Anomalies in the Global Ocean



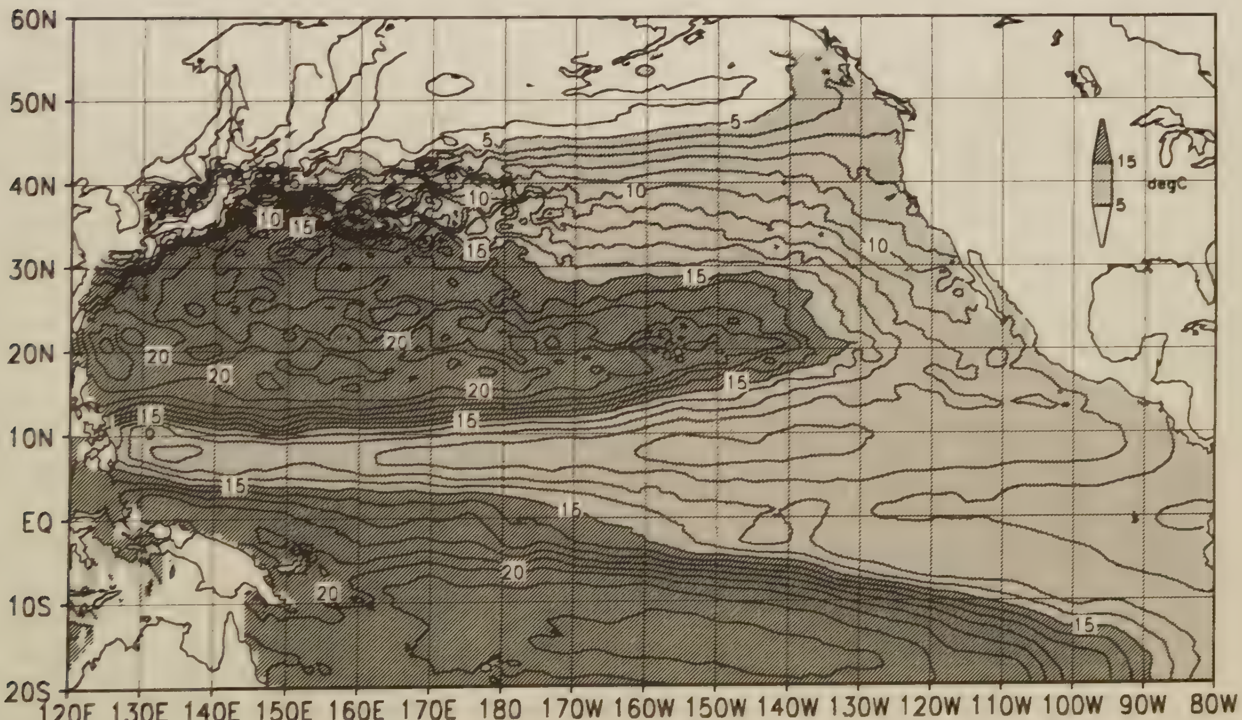
第17図　全球月平均海面水温図（上）及び偏差図（下）（2003年 7月）

Fig. 17 Monthly mean SST over the global ocean (top) and anomalies (bottom) for July 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



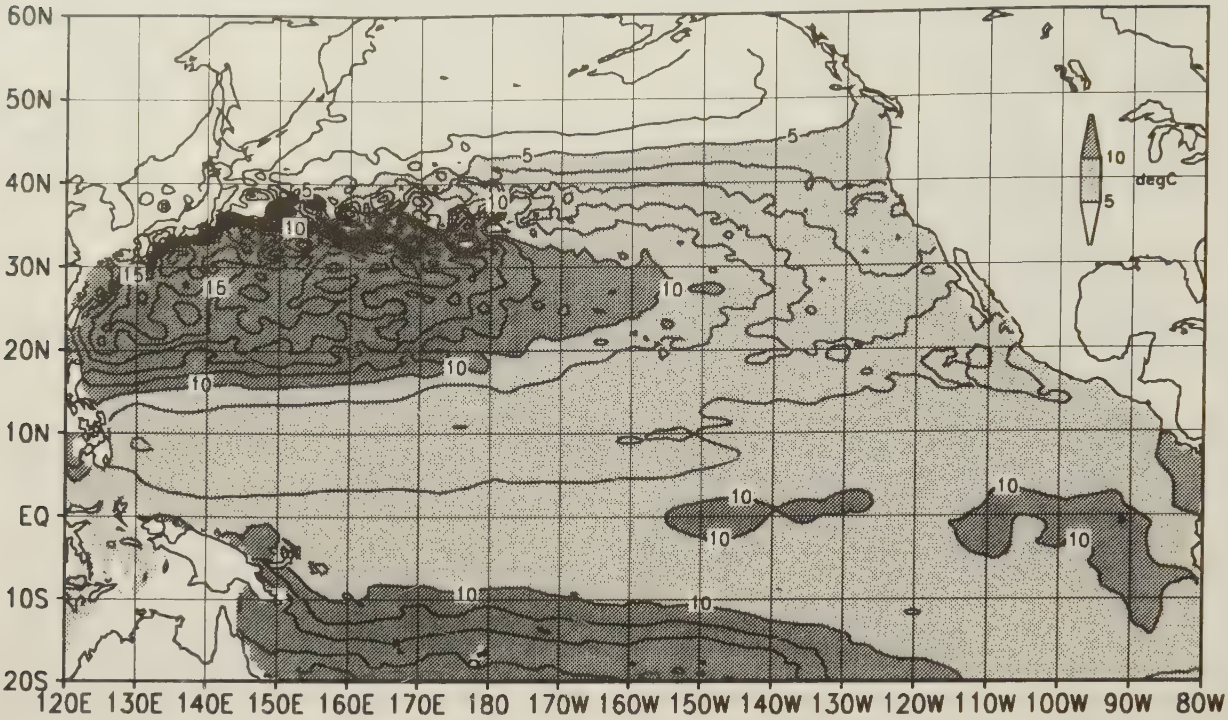
第 18 図　太平洋月平均表層水温図（深さ 100 m）　(2003 年 7 月)
（海洋総合解析システムによる）

Fig. 18　Monthly mean subsurface (100 m) temperature in the Pacific Ocean for July 2003. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



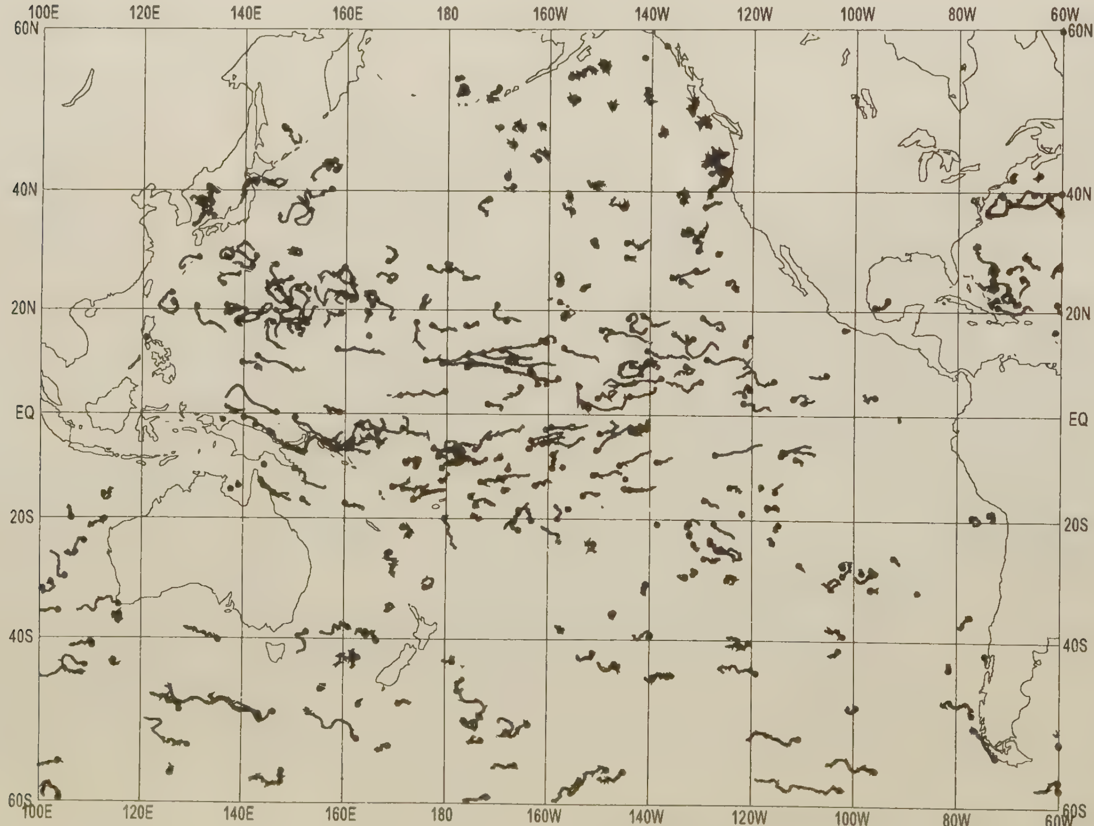
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（海洋総合解析システムによる）

Fig. 19　Monthly mean subsurface (200 m) temperature in the Pacific Ocean for July 2003. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第 20 図　太平洋月平均表層水温図（深さ 400 m）　(2003 年 7 月)
（海洋総合解析システムによる）

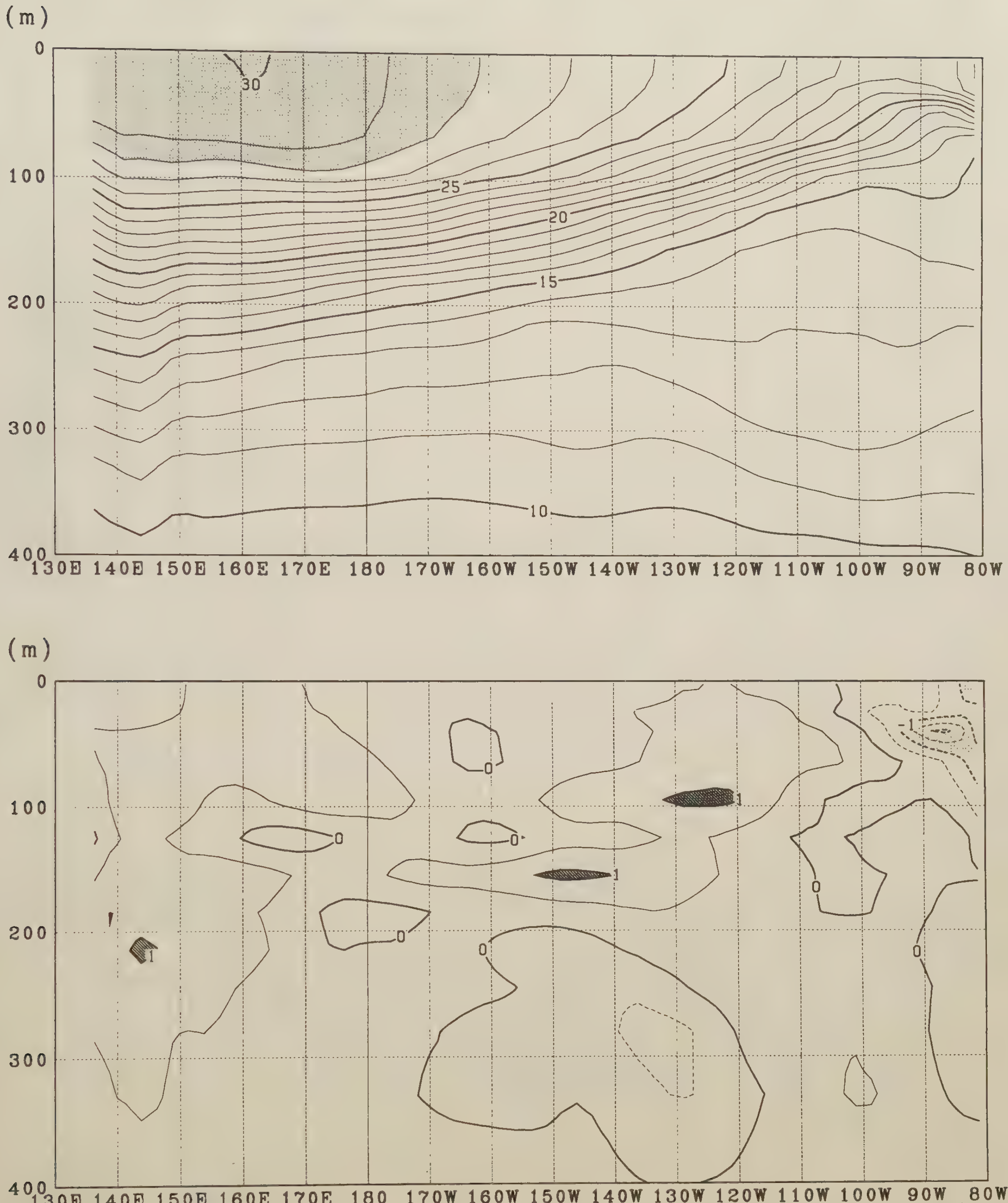
Fig. 20　Monthly mean subsurface (400 m) temperature in the Pacific Ocean for July 2003. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第 21 図　太平洋ブイ流跡図（2003 年 7 月）

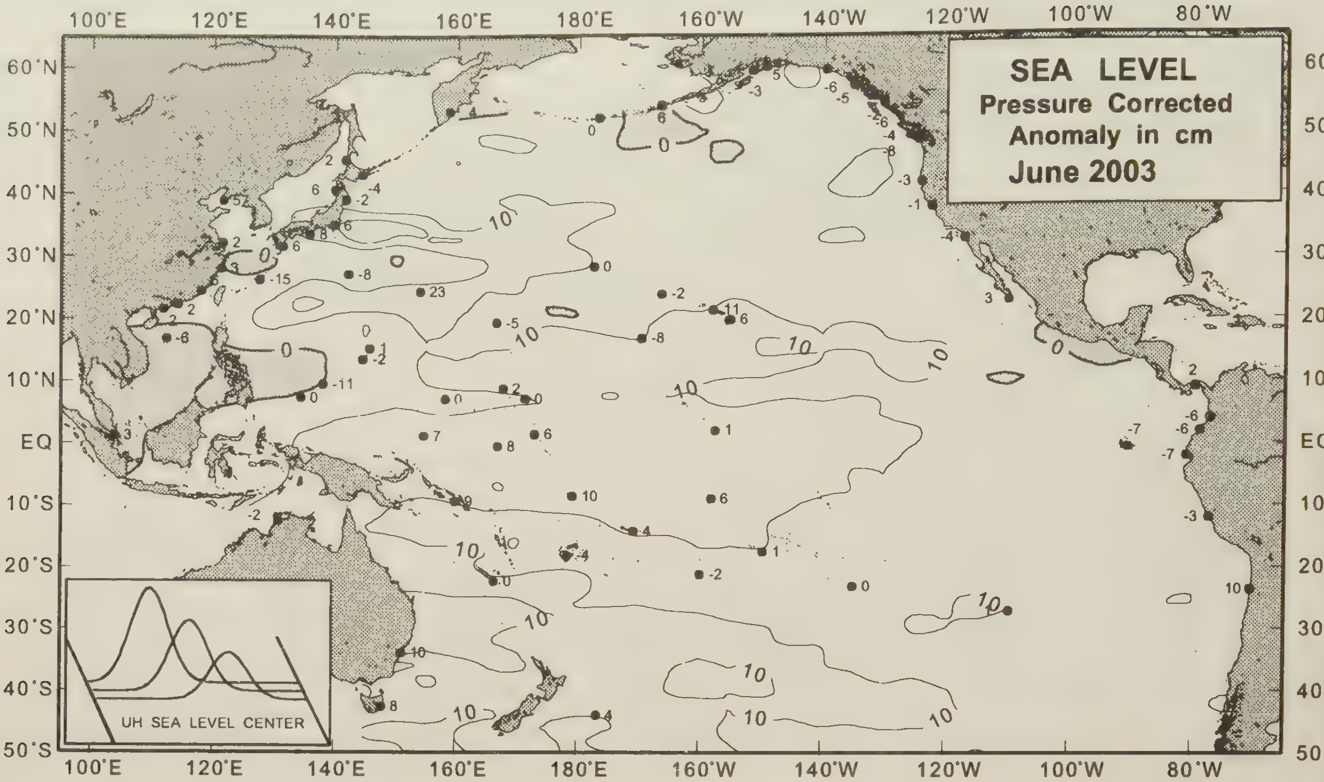
Fig. 21　Trajectories of drifting buoys in the Pacific Ocean during July 2003. Each track is for one buoy. Small circles represent the last positions for the month.

Depth-Longitude Sections of Equatorial Temperature & Anomalies



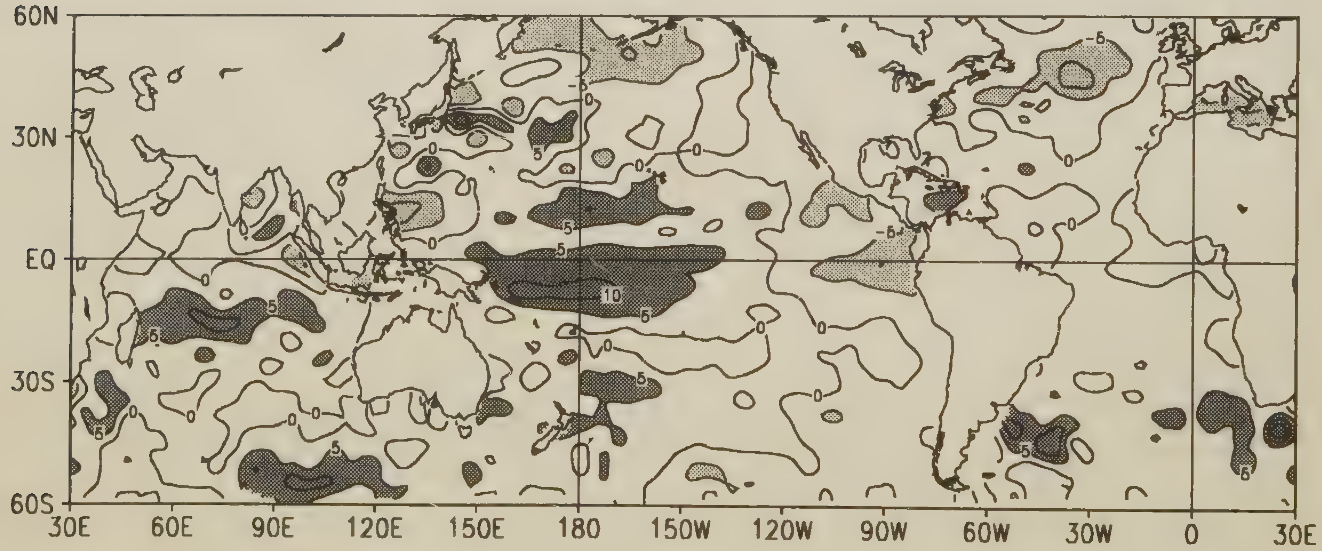
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Fig. 22 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for July 2003. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-2002 base period means.



第 23 図　太平洋月平均海面水位偏差図 （2003 年 6 月）

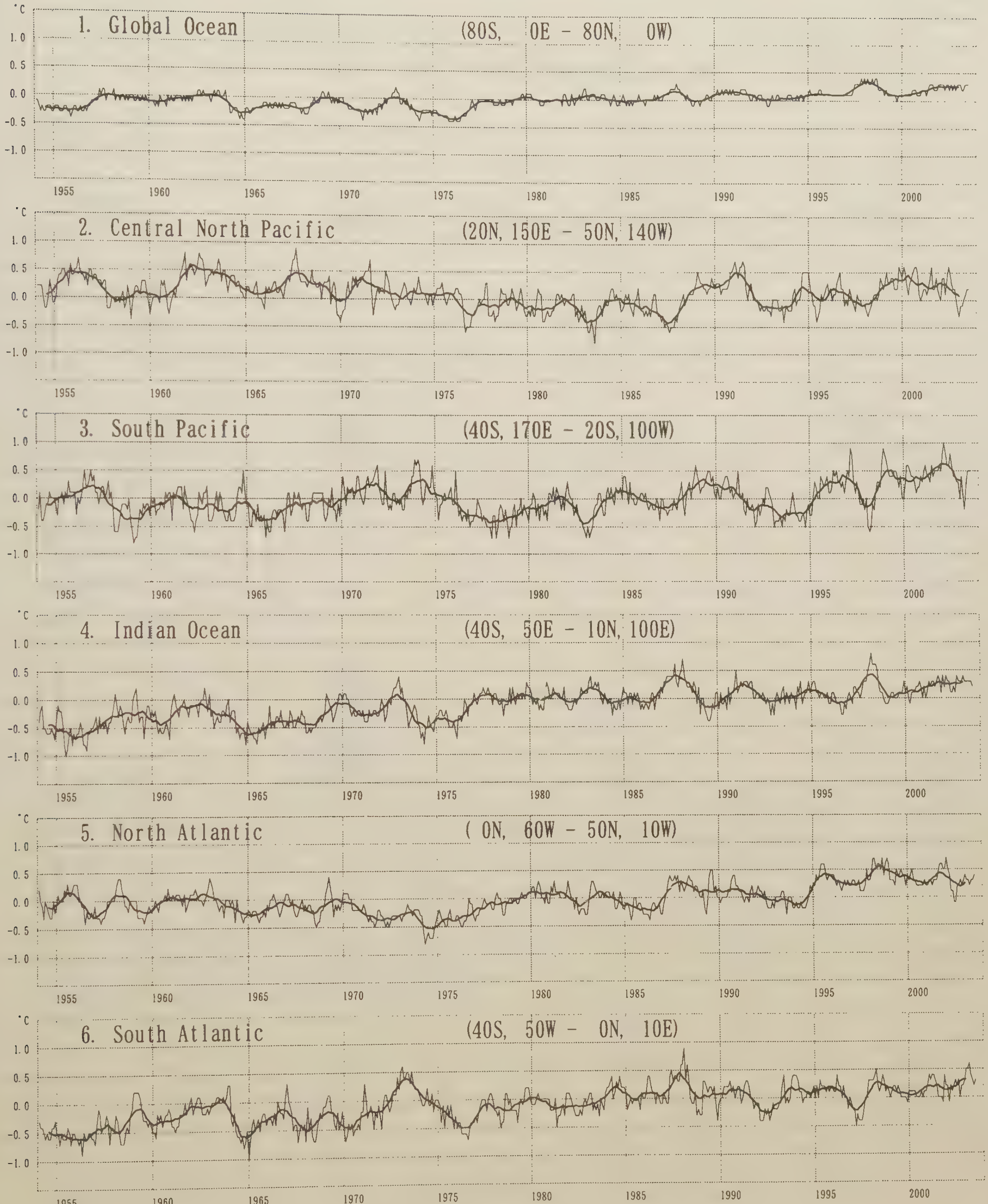
Fig. 23　Monthly sea level anomalies for June 2003 obtained from mean sea level (1993-2001) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 24 図　全球月平均海面高度偏差図 （2003 年 6 月）

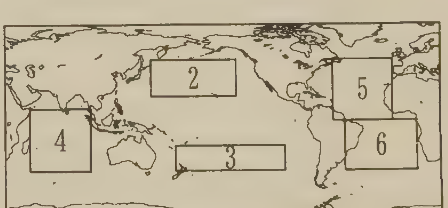
Fig. 24　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of Jason-1 for June 2003. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

Long-term Variation of Monthly Mean SST Anomalies

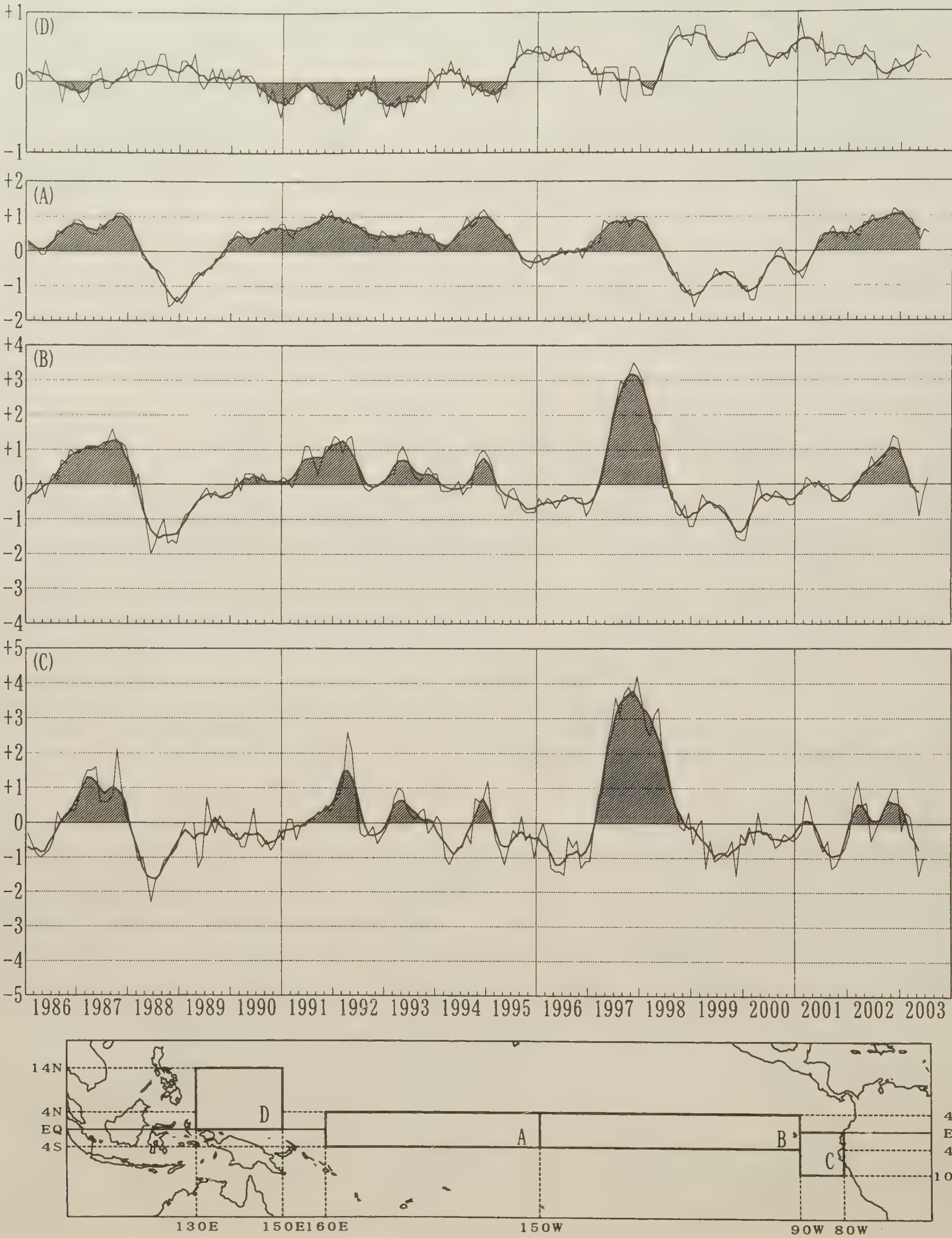


第25図 海域平均海面水温偏差の長期変動

Fig. 25 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1971-2000). Thin lines show the monthly mean and thick lines their 13-month running means.



Time Series of Tropical Pacific SST Anomalies



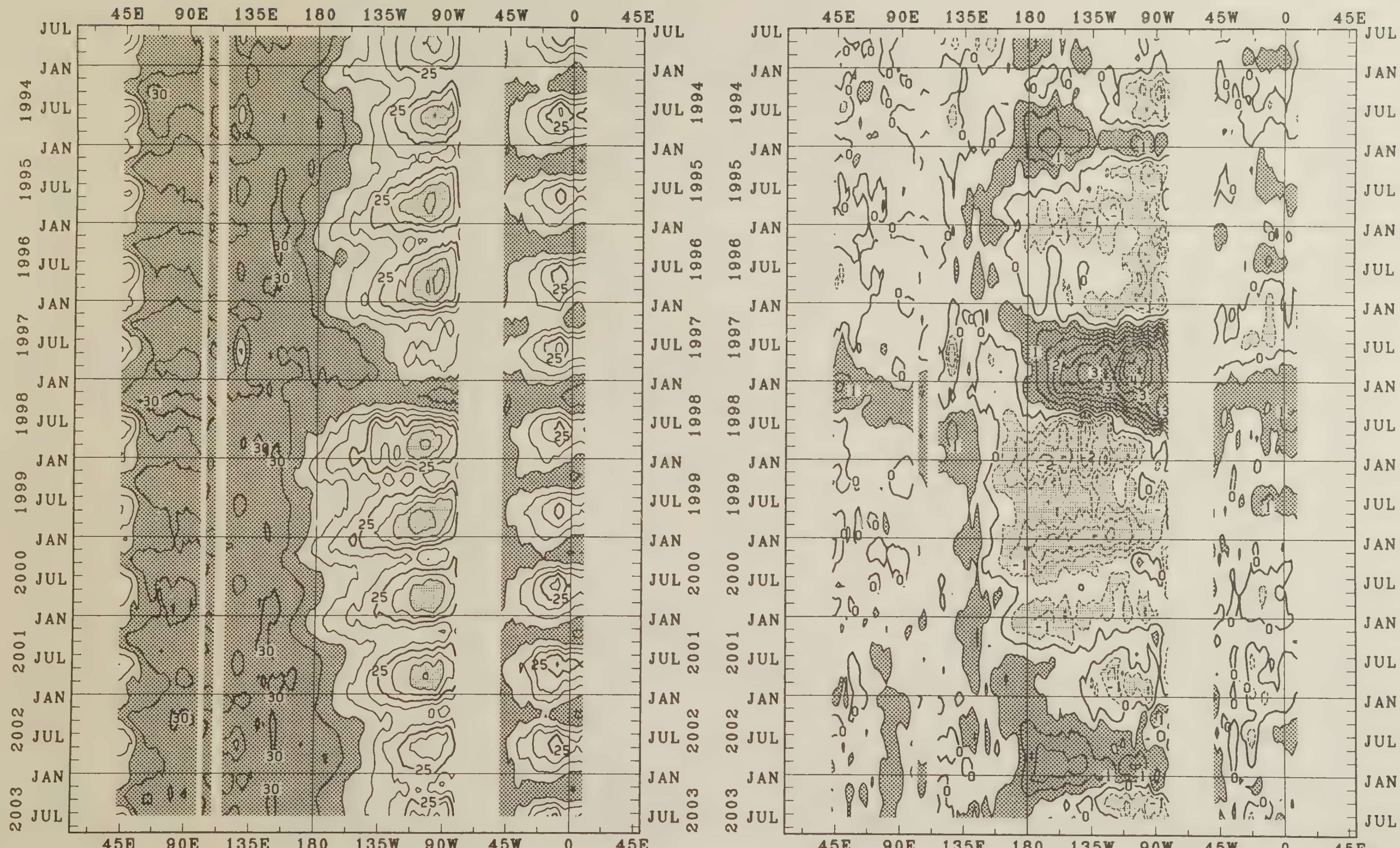
第26図　太平洋熱帯域の海面水温偏差時系列図

Fig. 26 Time series of monthly mean SST anomalies (°C) in the tropical Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1971-2000).

MONTH YEAR	SEA SURFACE TEMPERATURE AND ANOMALY (°C) REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	SEA LEVEL PRESSURE ANOMALY (hPa) TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 01	29.4	0.9	27.4	-0.6	25.1	-0.3	24.1	-0.4	0.8	2.5	0.6
FEB 01	28.9	0.6	27.2	-0.8	26.0	-0.3	25.8	-0.2	1.0	-0.4	-3.2
MAR 01	29.1	0.6	27.6	-0.5	27.3	0.2	27.1	0.8	0.8	1.3	-0.2
APR 01	29.4	0.6	28.0	-0.2	27.3	0.1	25.8	0.4	0.1	-0.1	-0.3
MAY 01	29.7	0.4	28.7	0.1	26.8	-0.1	24.1	-0.2	-0.7	-0.2	0.9
JUN 01	30.1	0.7	28.9	0.4	26.3	0.1	22.4	-0.5	0.2	-0.2	-0.5
JUL 01	29.5	0.2	29.0	0.5	25.3	-0.1	21.1	-0.8	-0.2	-0.1	0.3
AUG 01	29.5	0.3	28.9	0.5	24.7	0.0	20.4	-0.5	-0.7	-0.9	0.1
SEP 01	29.6	0.3	29.1	0.7	24.2	-0.5	19.2	-1.3	0.1	-0.2	-0.4
OCT 01	29.9	0.5	28.8	0.4	24.2	-0.5	19.7	-1.2	-0.1	-0.9	-0.9
NOV 01	29.8	0.5	28.9	0.5	24.2	-0.5	20.9	-0.9	0.6	0.7	-0.4
DEC 01	29.3	0.3	28.5	0.3	24.5	-0.5	22.2	-0.7	-0.8	-1.2	0.3
JAN 02	28.7	0.2	28.7	0.7	25.0	-0.4	24.2	-0.3	0.3	1.3	0.7
FEB 02	28.6	0.3	28.5	0.5	26.3	0.0	26.7	0.7	0.7	1.5	-0.2
MAR 02	28.8	0.3	28.5	0.4	27.2	0.1	27.5	1.2	-0.2	0.4	1.0
APR 02	29.3	0.5	29.0	0.8	27.5	0.3	25.9	0.5	-0.1	0.1	0.3
MAY 02	29.7	0.4	29.4	0.8	27.2	0.3	24.9	0.6	-1.3	-1.1	0.7
JUN 02	29.8	0.4	29.5	1.0	27.0	0.8	22.4	-0.5	-0.4	-0.2	0.4
JUL 02	29.3	0.0	29.3	0.8	25.9	0.5	21.7	-0.2	-0.7	0.5	1.6
AUG 02	29.2	0.0	29.3	0.9	25.3	0.6	21.0	0.1	-1.2	-1.4	0.5
SEP 02	29.3	0.0	29.3	0.9	25.5	0.8	20.9	0.4	-0.5	-0.3	0.8
OCT 02	29.5	0.1	29.3	0.9	25.7	1.0	21.6	0.7	-0.5	-1.0	-0.3
NOV 02	29.6	0.3	29.6	1.2	26.1	1.4	22.8	1.0	-0.4	0.1	1.0
DEC 02	29.2	0.2	29.3	1.1	26.3	1.3	23.9	1.0	-1.0	-0.1	1.7
JAN 03	28.7	0.2	29.1	1.1	26.2	0.8	24.3	-0.2	-0.1	-0.1	0.2
FEB 03	28.4	0.1	28.9	0.9	26.8	0.5	26.3	0.3	-0.5	-1.5	-0.2
MAR 03	28.7	0.2	29.0	0.9	27.0	-0.1	26.5	0.2	-0.3	-0.2	0.5
APR 03	29.3	0.5	28.8	0.6	27.1	-0.1	24.9	-0.5	-0.1	0.5	0.8
MAY 03	29.7	0.4	28.9	0.3	26.0	-0.9	22.8	-1.5	-0.6	-0.7	0.2
JUN 03	29.8	0.4	29.1	0.6	25.9	-0.3	21.9	-1.0	-0.9	-0.9	0.4
JUL 03	29.6	0.3	29.0	0.5	25.6	0.2	20.9	-1.0	0.2	0.7	0.3

第1表　太平洋熱帯域の大気及び海洋の監視指数

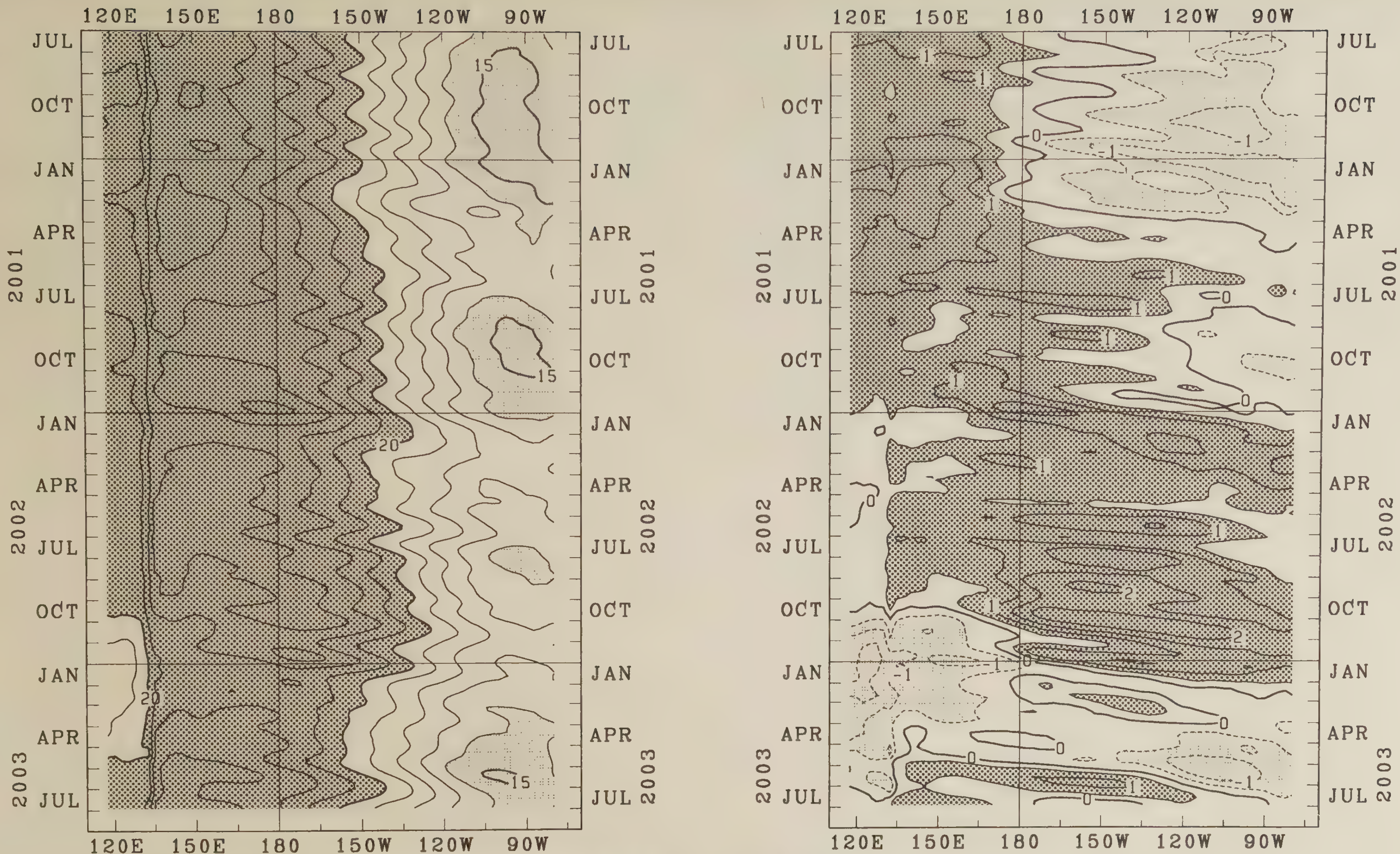
Table 1 Atmospheric and oceanic monitoring indices in the tropical Pacific Ocean



第 27 図　赤道に沿った海面水温（左）および偏差（右）の時間-経度断面図

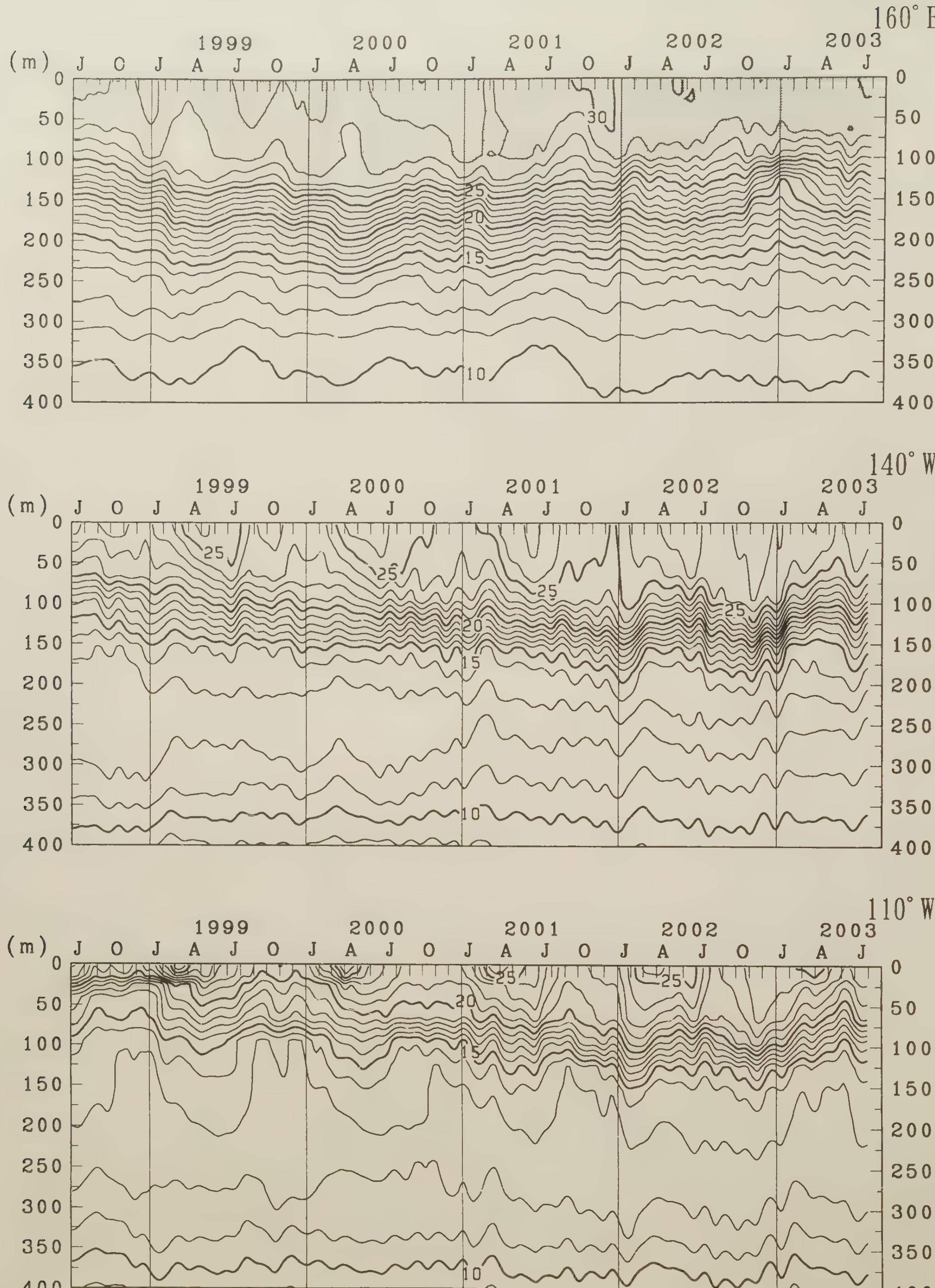
Fig. 27　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2 °N-2 °S) in the global ocean. Contour interval is 1 °C (left) and 0.5 °C (right). Values greater than 28 °C (+0.5 °C) are shaded and values less than 23 °C (-0.5 °C) are spotted in the left (right) panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1971-2000 base period means.

Time-Longitude Sections of Ocean Heat Content & Anomalies (Eq.)



第28図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig. 28 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C (+0.5°C) are shaded and values less than 16°C (-0.5°C) are spotted in the left (right) panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-2002 base period means.



第29図　太平洋赤道域の表層水温の時間－深度断面図

（上：西部、中：中部、下：東部）

Fig. 29 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C. Values greater than 28°C are shaded.

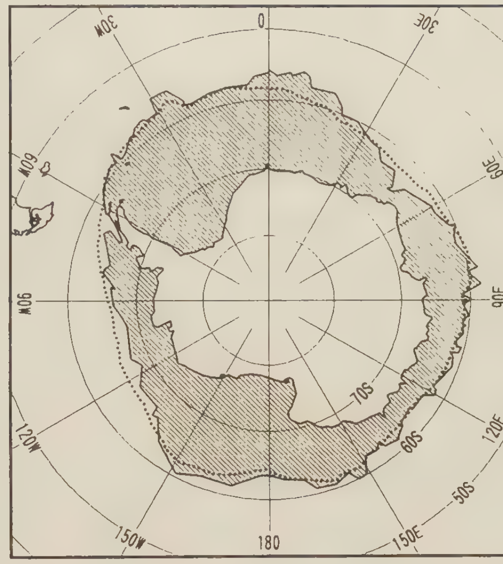


第30-1図　北極域の海氷図（2003年 7月18日）

Fig.30-1 Sea ice chart in the Arctic on 18 Jul. 2003.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

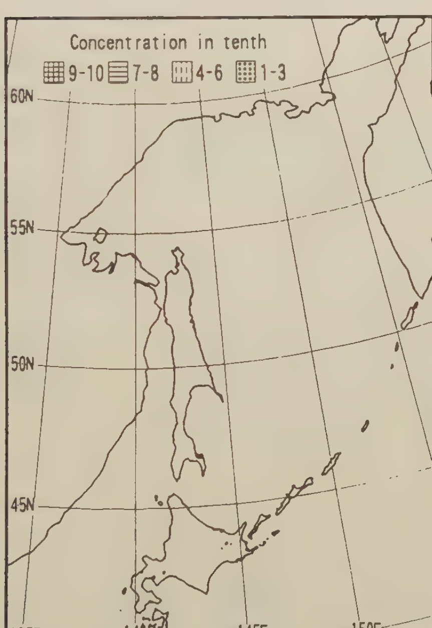


第30-2図　南極域の海氷図（2003年 7月18日）

Fig.30-2 Sea ice chart in the Antarctic on 18 Jul. 2003.

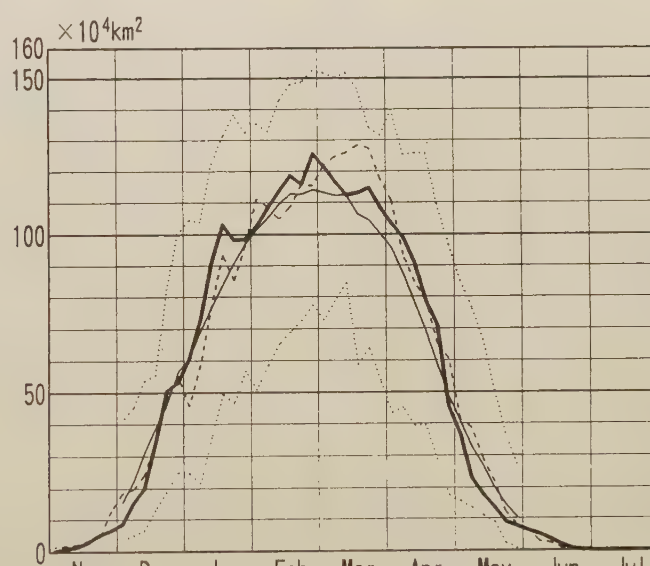
The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

The data source is the National Ice Center (USA).



第30-3図 オホーツク海の海氷図（2003年 7月15日）

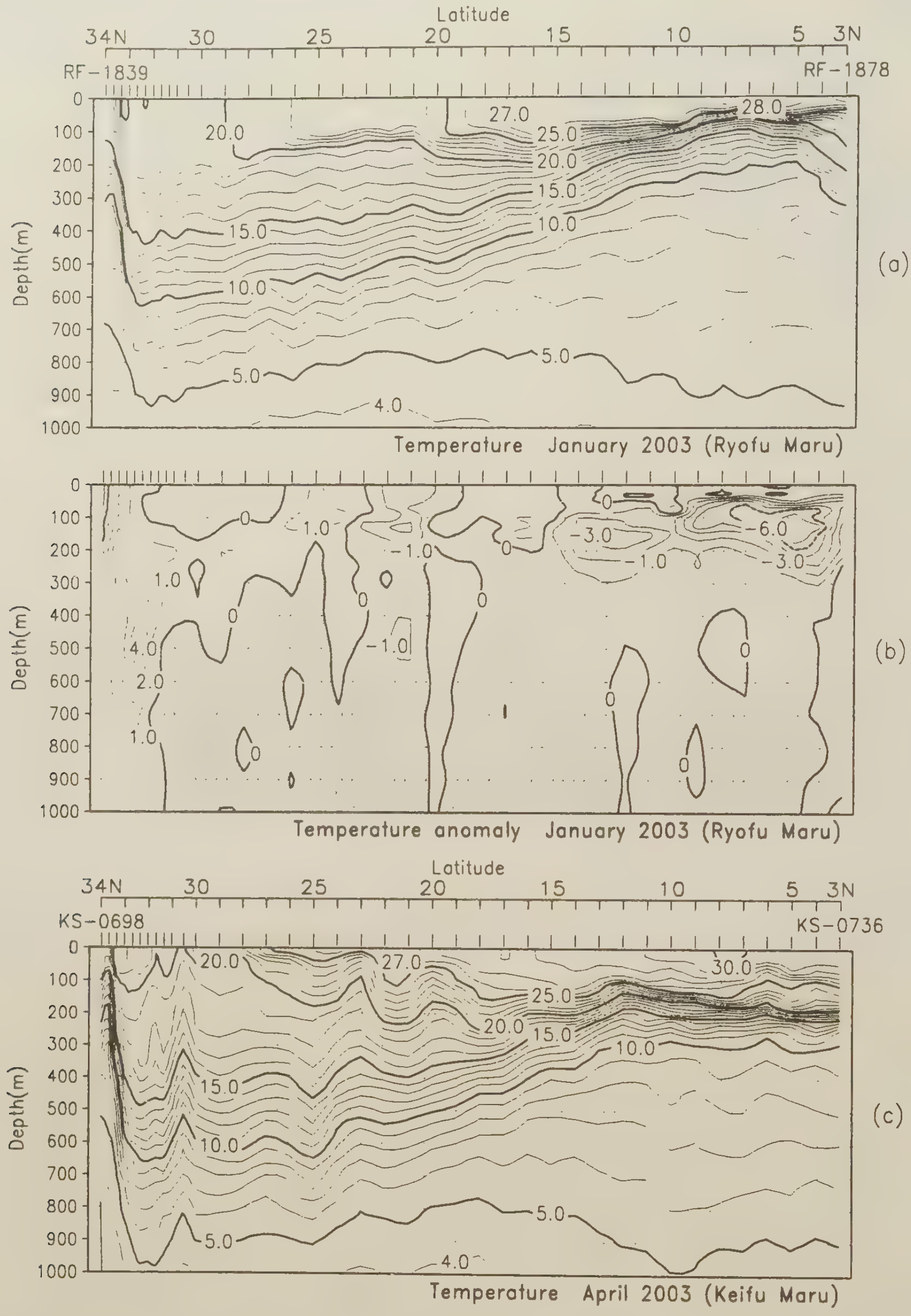
Fig.30-3 Sea ice chart in the Sea of Okhotsk on 15 Jul. 2003.

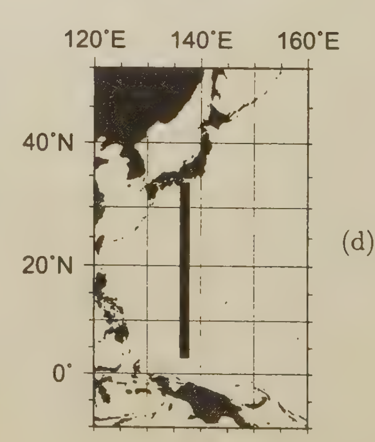


第30-4図 オホーツク海の海氷域面積

Fig.30-4 Time-series of 5-day sea ice area in the Sea of Okhotsk.

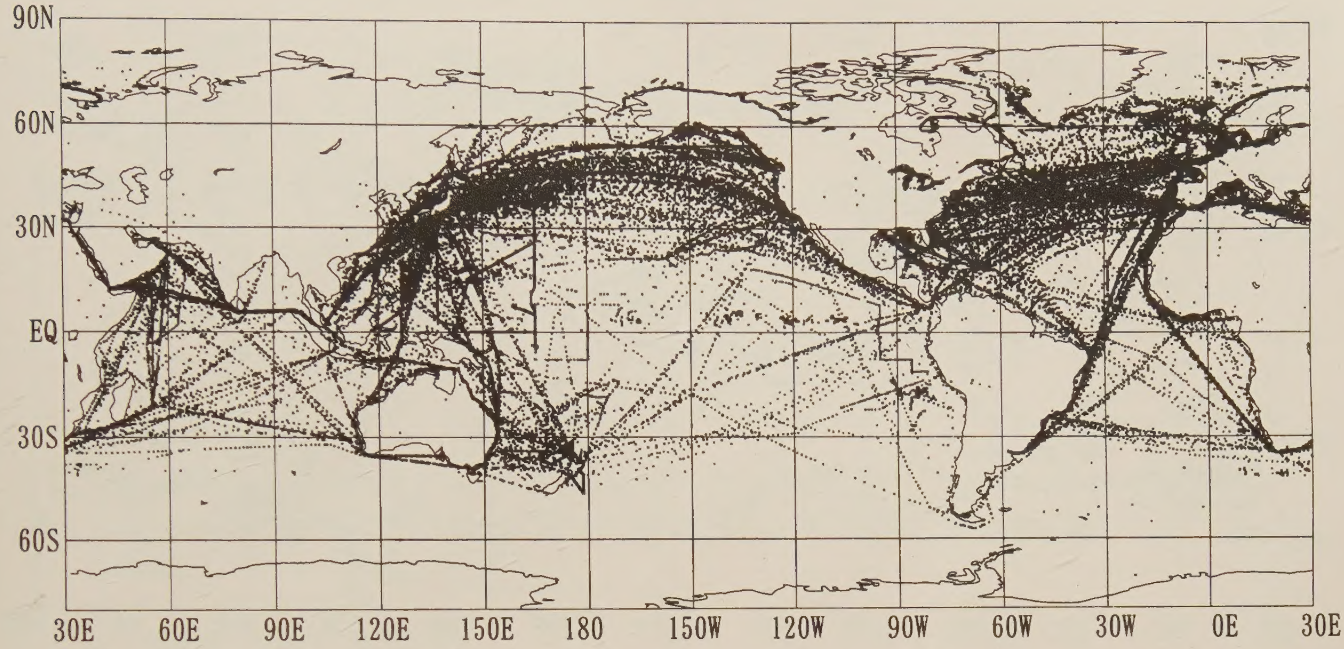
: current season (2002/2003)
: mean extent (1971–2000)
: maximum or minimum extent (1971–2002)
: last season (2001/2002)





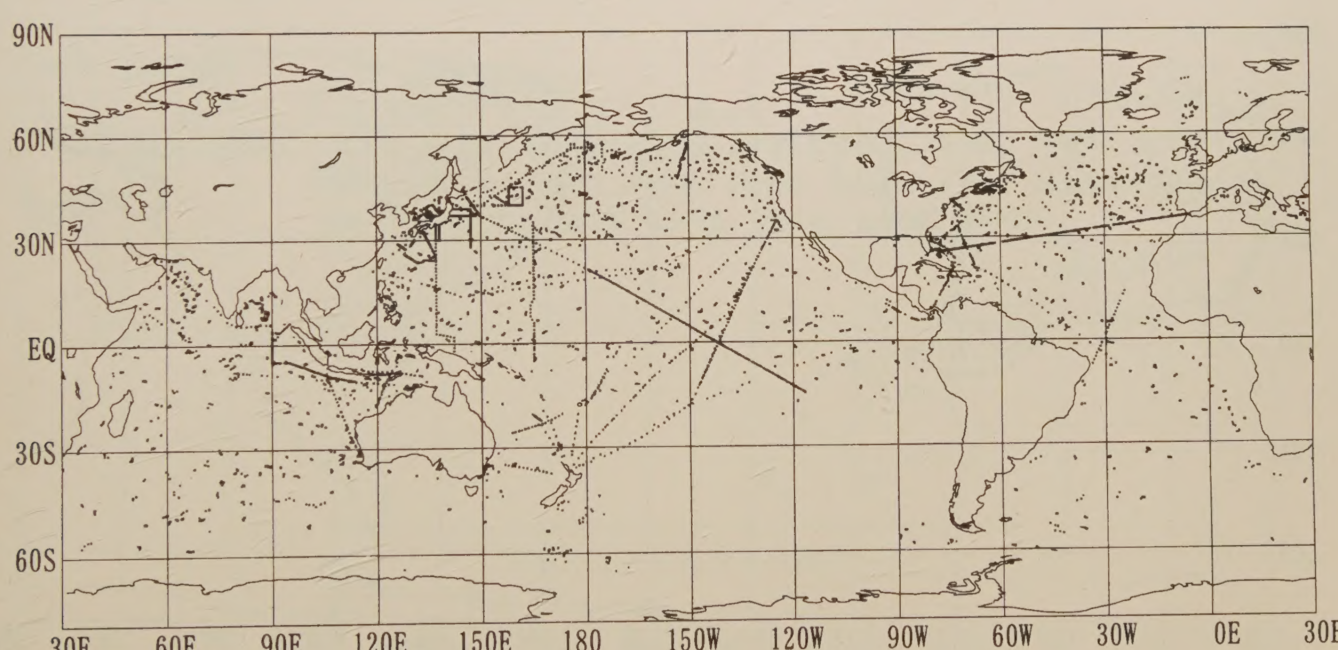
第 31 図 気象庁凌風丸 (2003 年 1 月) 及び神戸海洋気象台啓風丸 (2003 年 4 月) による東経 137 度に沿った水温鉛直断面図. (a) 水温 (2003 年 1 月), (b) 水温平年偏差 (2003 年 1 月, 平年値の統計期間は 1971〜2000 年), (c) 水温 (2003 年 4 月), (d) 観測位置図.

Fig. 31 Vertical sections of water temperature along 137°E. (a) Water temperature and (b) Water temperature anomalies observed in January 2003 by R/V Ryofu Maru, (c) Water temperature observed in April 2003 by R/V Keifu Maru, (d) Location of oceanographic observations along 137°E. Anomalies are computed in the 1971–2000 base period means.



SHIP messages

Total data:181331

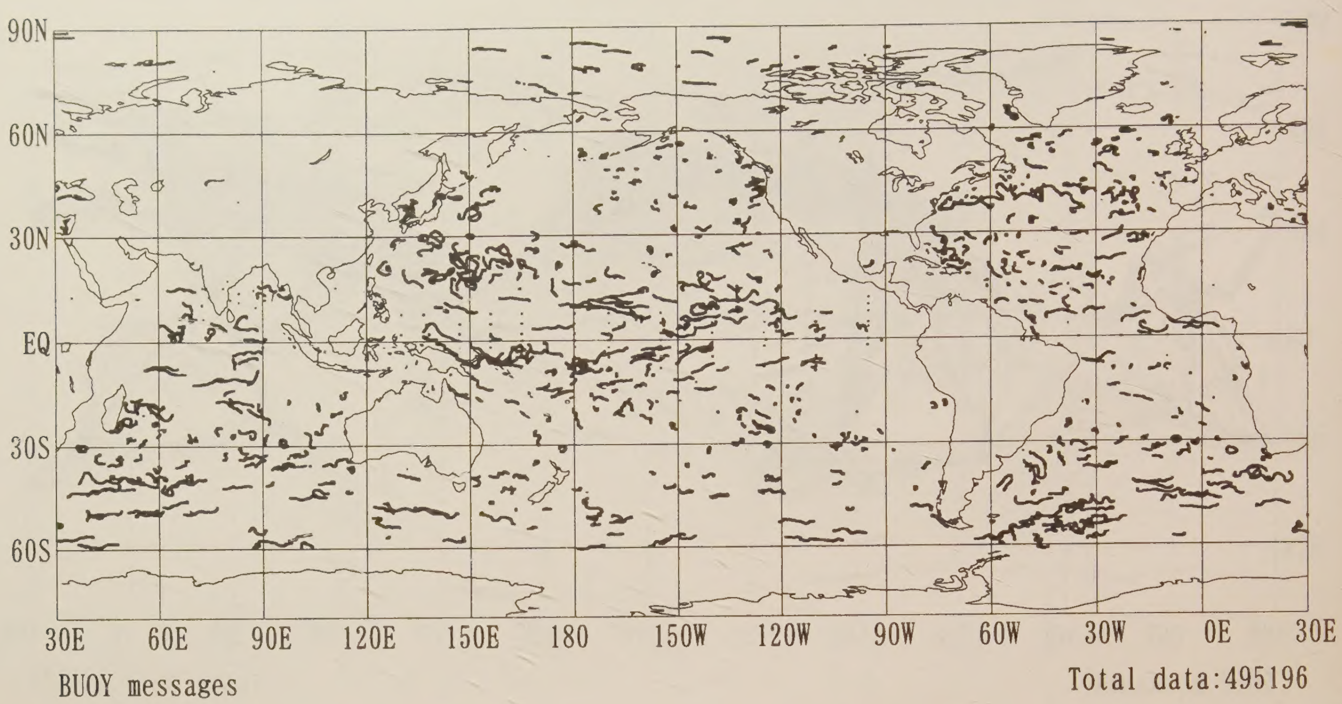


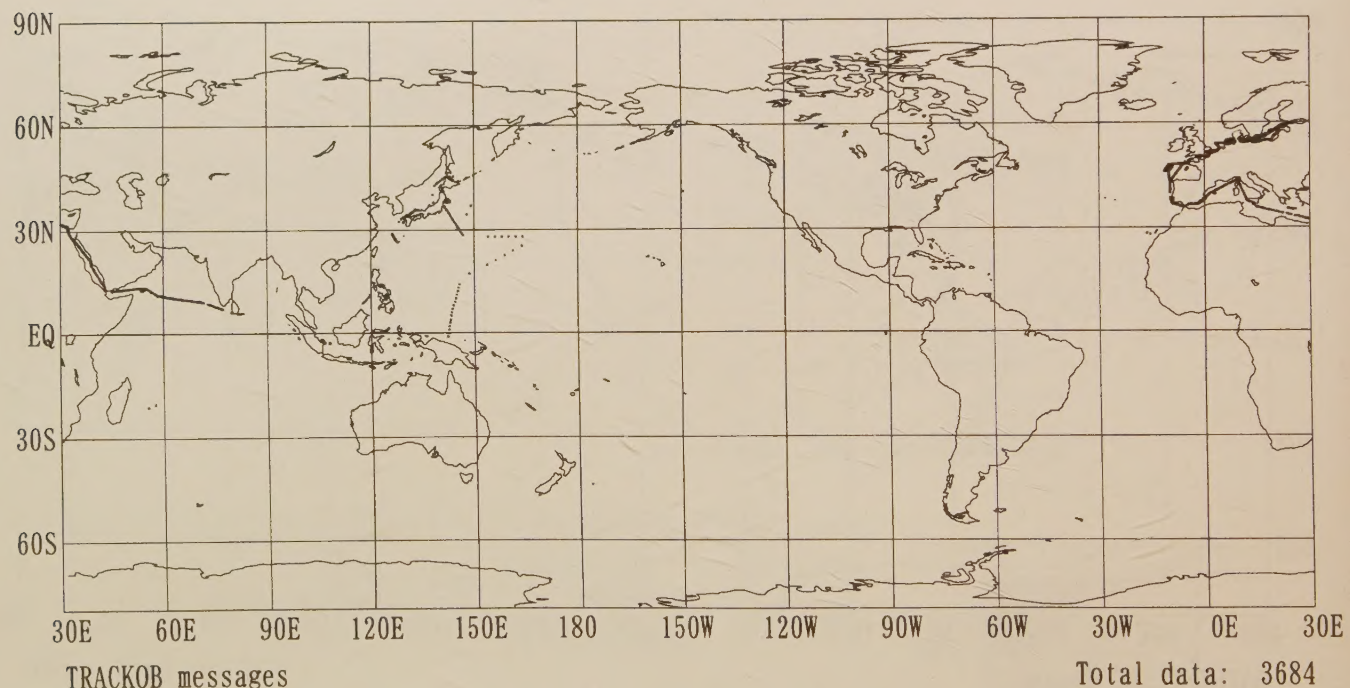
BATHY/TESAC messages

Total data: 7001

第32-1図　測点分布図(2003年 7月)

Fig. 32-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for July 2003.





第32-2図　測点分布図(2003年 7月)

Fig. 32-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for July 2003.

気 象 庁 海 洋 月 報

Monthly Ocean Report

July 2003 (No. 127)

本月報掲載の 2003 年 7 月のプロダクトには、気象庁が観測したデータ及び GTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

水産総合研究センター

海洋科学技術センター、（社）漁業情報サービスセンター

東北大学

水産試験場等（北海道、青森県、岩手県、宮城県、山形県、福島県、茨城県、千葉県、東京都、新潟県、富山県、石川県、福井県、静岡県、愛知県、三重県、京都府、兵庫県、和歌山県、鳥取県、島根県、山口県、高知県、佐賀県、宮崎県）

（順不同）

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